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There Is Nothing Like a DREEM to Create the Future of Medical Education: International and Hungarian Medical and Dentistry Students' Perceptions on their Learning Environment in Hungary

PhD Thesis

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List of abbreviations

DREEM – Dundee Ready Education Environment Measure

EE – Education Environment

EU – European Union

EP – English Programme

GDP – Gross Domestic Product

GP – German Programme

HE – Higher Education

HEI – Higher Education Institution

HP – Hungarian Programme

I – International Students

LE – Learning Environment

OECD – Organization of Economic Co-operation and Development

SSI – Semi-Structured Interview

SASP – Students' Academic Self-Perceptions

SPA – Students' Perceptions of Atmosphere

SPL – Students' Perceptions of Learning

SPT – Students' Perceptions of Teachers

SSSP – Students' Social Self-Perceptions

UPMS – University of Pécs Medical School

WTO – World Trade Organization

"Observe constantly that all things take place by change." Marcus Aurelius [1]

Preface

The world has seen tremendous changes since the mid-twentieth century. After the Second World War and the collapse of the Soviet Union, the collaboration between countries began to flourish. While globalisation at first mainly affected the economic field, the social effects soon followed suit. As more and more countries opened to international labour force, education inevitably became internationalised.

Historically, there was an existing tradition among universities accepting students from other countries since the first universities were established during the Middle Ages. However, the vast extent of student mobility which began in the last decades of the 20th century is unprecedented. In some countries, international students have since become an important part of university revenues, therefore, influenced institutions in higher education to compete with their local and international peers. Rankings of the best universities were created, and the increasing influx of international students slowly began the transformation of the student population.

Similar tendencies were observed in Hungary after it gained independence from the Soviet Union in 1989. Once Hungary joined the European Union in May 2004, diversity at universities increased tenfold.

One of the favoured choices of international students has been medical education. The exponential growth of world population inevitably led to the need to extend the capacity of healthcare, thus increasing the significance of medical education. The most popular countries in Europe, chosen by international medical students, include the United Kingdom, Italy, the Czech Republic, and Hungary [2].

In Hungary, the cohort of international students became most notable within the four Medical Schools in Budapest, Debrecen, Pécs, and Szeged. These students originate from a multitude of countries, possess diverse cultural backgrounds, varied experiences, and perceptions regarding formal education. This raises the following questions. How well do the Hungarian

Medical Schools meet the expectations of the international students? Are the students satisfied with their medical education, compared with their domestic, Hungarian peers?

To the best of my knowledge, there has been no research conducted to address the above issues in reference to the national level, therefore, my aim was to carry out a holistic investigation regarding students' perceptions on their learning environment, which includes all aspects of their studies, ranging from the actual physical surroundings to teaching methodologies and their own perceived professional knowledge.

While writing my thesis, I drew inspiration from Victor Hugo's masterpiece, "Les Misérables," and selected the following quote as a symbol for both the objective of this research and the applied research tool, the DREEM questionnaire: *"There is nothing like a dream to create the future."* [3] . Therefore, this became the main title of my dissertation encapsulating the entire study.

I sincerely hope the outcomes of this cross-sectional research study will prove beneficial towards the improvement of the learning environment at the medical schools of Hungary, thus increasing their international appeal to the forthcoming generations of aspiring medical students.

1. Introduction

1.1. Globalisation: the catalyst of change

Globalisation is one of the primary concepts which affect our world the most. As Giddens [4, p. 64] describes it, “Globalisation refers essentially to that stretching process, in so far as the modes of connection between different social contexts or regions become networked across the earth's surface as a whole.” Following the Second World War and the end of the Bretton Woods System (an initiative to maintain order in the post-war era), flourishing economies began to transcend national borders, initiating an avalanche of events [5], [6]. According to Friedman, there were ten important milestones which bore the greatest impact upon the world, “flattening” it and enforcing the era of globalisation [7]. These ten events, or “forces”, include the following:

The Fall of the Berlin Wall
• democracy and free market, an easy-to-use operating system (Windows 3.0)
Netscape
• wide-spread availability of the Internet with a new browser
Work Flow Software
• work-related cooperation starts to flourish over the Internet
Open-sourcing
• development of open-source tools, accessible for free
Outsourcing
• collaboration between the USA and India
Offshoring
• corporate entities open factories in China
Supply Chaining
• cooperation among suppliers, sellers and customers
Insourcing
• delivery services expand the supply chains
Informing
• with the aid of search engines (e.g., Google), information becomes accessible to all
Wireless
• rapid advancement in fields of technology

Table 1. The ten forces which "flattened the world" [7]

As displayed in Table 1., the first stepping stone of globalisation was the "unification" of the world following the fall of the Berlin Wall. Without the autocratic regime of the Soviet Union, free market began to flourish. Nederveen Pieterse also marks the 1990s as an era when the key notions of globalisation occurred [6]. In 1990, IBM released a new operating system, Windows 3.0, which simplified the usage of personal computers and digital content creation. The second important milestone was in 1995, when Netscape released its first browser, allowing the public to easily access the Internet. Individuals soon began seizing advantage of the virtual space and work-related collaborations began to span across continents. Interconnectedness was further enforced by the advent of open-source tools, which were free to use. In 1996, the first fibre optic cables were installed, allowing a secure and fast internet connection while enabling the collaboration of economic giants, such as the USA and India. In 2001, China became a member of the World Trade Organization (WTO), flooding the free market with cheap labour force. This "flattened" the world even further, as corporate entities began opening their factories in China, rather than employing a cheaper workforce, as was seen in India. The seventh major step was the appearance of supply chains, suppliers, retailers, and customers all being parts of a global conglomerate. Soon, logistic corporations (e.g., UPS or FedEx) absorbed their fair share of supply chain processes. The last two forces were the appearance of search engines (e.g., Google was released in 1996) and the rapid advancement in the field of technology: the increasing capacity and features of computers, wireless technologies and handheld devices [7], further extended the tentacles of globalisation [8].

Globalisation, global collaboration, and competition [9] were notions primarily related to the field of economy, and bore a notable, positive effect on real GDP [10]. However, they soon arched over concepts such as culture, politics, environment, and society, as depicted in Figure 1. [11]. One important segment of the latter was higher education (HE).

Figure 1. Dimensions of globalisation [11]

1.2. Globalisation and higher education

HE can be described as the next stage beyond secondary education [12]. As a result of social globalisation, individuals began moving between countries for various purposes, such as better living conditions and job opportunities [13]. Education (and, most importantly, HE) has always been important for most countries, however, its value only increased with the polarisation of the labour market [14]. The new demands of the globalised word intensely impacted HE [15], as it is driven by, and can also be a driving force of globalisation [16]. Fox and Hundley identify the main global challenges of 2020, according to a poll conducted by 70 participants at a conference hosted by the Royal Society in London. These main challenges included the following: climate change, food security, loss of biodiversity, water shortages, global population, education, nuclear issues, pandemics, ageing, poverty, and terrorism [13, p. 8].

While education may not be the first and foremost issue of the globalised world, its importance is still quite noteworthy. Marginson and Wende argue that globalisation and internationalisation are affecting HE on different levels, globalisation being a more complex compilation of processes, while internationalisation is mostly defined as the collaboration between different nations [17]. There are multiple means in which HE was affected by globalisation, setting up trends and posing challenges. Figure 2. illustrates the ways globalisation affected the educational system [14].

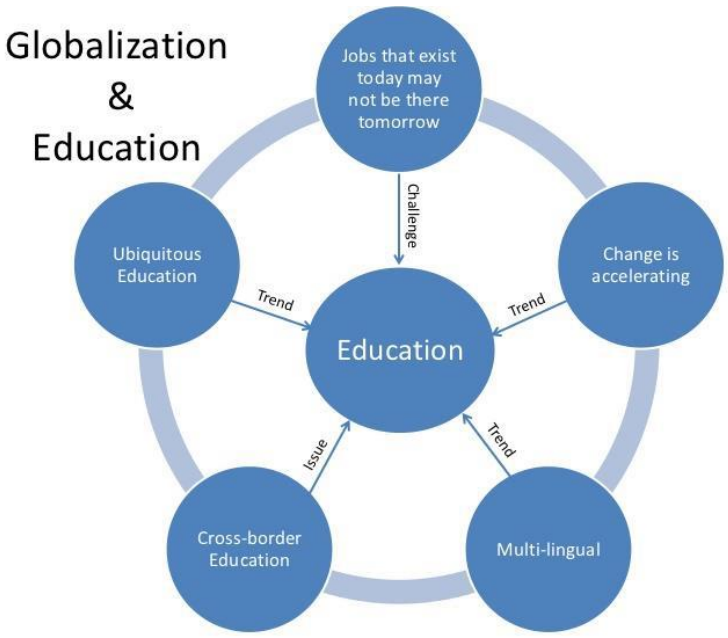


Figure 2. Interrelation between globalisation and education [14]

Tight emphasises that universities have always been open to students from other countries, yet the student population was still linked to the same geographic region in most cases [18]. This characteristic feature was also, inevitably, changed by globalisation, as higher education institutions (HEIs) and the sector of education in general have always been among the first to open up and react to international processes, since they need to be ready in preparing students for the demands of the globalised labour market [12], [17], [19]. Jermsittiparsert explains that there is a strong connection between social globalisation and education, the former continuously challenging the latter to keep up with all the trends and rapidly accelerating changes [14]. This "environmental pressure", posed by globalisation and internationalisation, resulted in an irreversible shift in HEIs [20]. With the appearance of global university rankings, HEIs were subjected to competitive pressure [17], which was, yet again, a relatively new phenomena regarding the educational sector. The perceived quality of education became one of the key factors which affected international students' decisions in choosing a HEI [21]. HE can be an essential part in the change of social status and possible advancement [12], such as an easier integration into the labour market [22], therefore bears great importance for many students.

1.3. Internationalisation of HE

Student mobility, the appearance of international and foreign students at HEIs is often viewed as a synonym of internationalisation, however, Knight explains that they are not synonyms, as the latter is a very complex process [23]. Rezaei et al. define internationalisation in HE as a collaboration between HEIs, mainly in the fields of teaching and research [20]. In order to extend the reach of HEIs, one of the key factors which needed internationalisation was the curriculum [20], [24]. Teichler lists six key elements which played a role in the internationalisation of HE:

1. knowledge (e.g., books) transfer across borders
2. physical mobility of teachers and students
3. international communication and cooperation
4. international education and research
5. international similarity (e.g., due to globalisation)
6. international reputation [25]

Education relying solely on national and cultural traditions was unfit to answer the challenges of the globalising world. Due to the bilateral nature of education, i. e. the cooperation of teachers

and students for a shared objective [26], intercultural skills and competences became essential [27] with the increasing internationalisation. However, as Dubbeld et al. highlight, oftentimes teachers are not prepared sufficiently to handle multinational and multicultural student groups [28].

As HEIs began to transform, responding to the global and international needs and demands, the number of international students began to rapidly increase, accounting for one of the major parts of contemporary mobility between countries [29]. From 1950 to 2009, their numbers increased from 107.000 to 3.4 million [19], [30], and in 2019, 6.1 million students were studying in tertiary education in a country other than their own. We can observe this continuous increase in Figure 3., which highlights the growth in international or foreign enrolment in tertiary education worldwide [21].

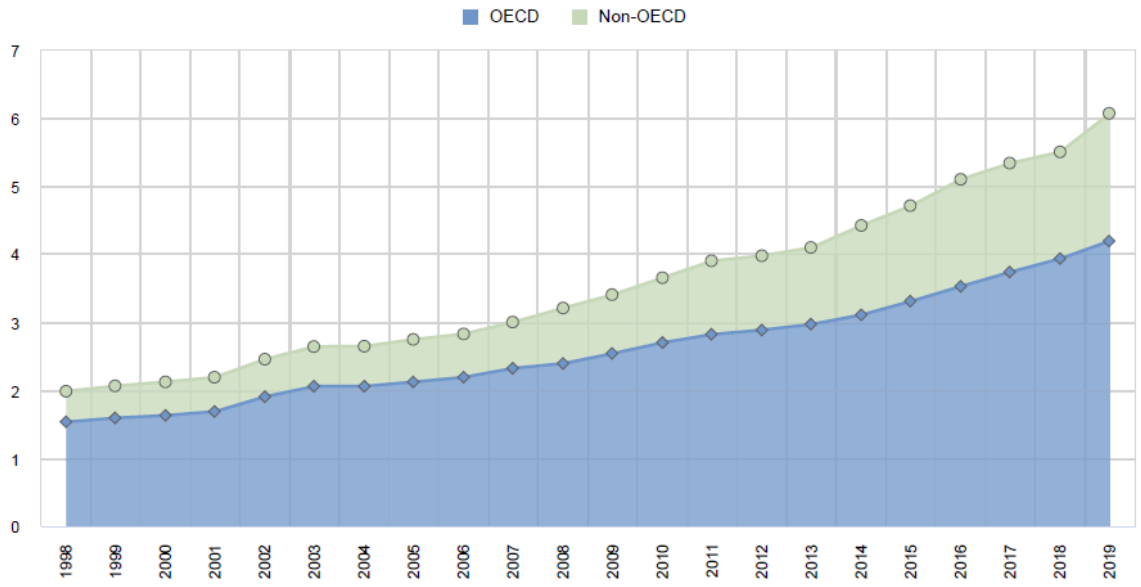


Figure 3. Growth in international or foreign enrolment in tertiary education worldwide (1998 to 2019). Number of international or foreign students enrolled in OECD and non-OECD countries, in millions [21]

The primary regions targeted by internationally mobile students include the USA and Europe, as displayed in Figure 4. Bolder lines represent a higher number of students moving between the capital cities of the given countries. It also clearly displays a strong interconnectivity between countries in Europe, and many Asian countries, of which are connected to western destinations with dark bold lines, indicating greater student mobility [19].

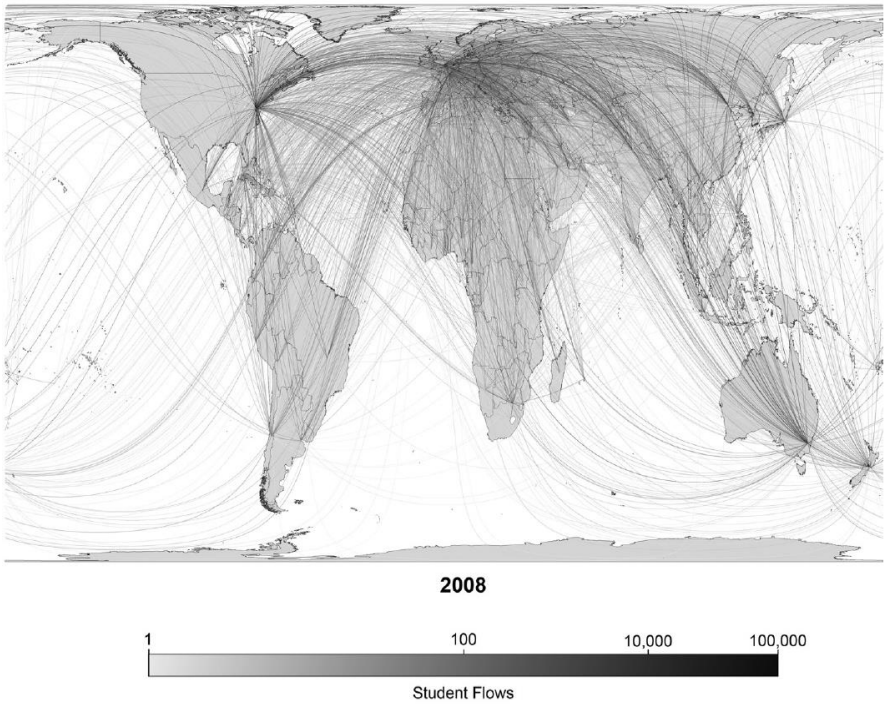


Figure 4. International student flow in 2008 [19]

"We have become not a melting pot but a beautiful mosaic. Different people, different beliefs, different yearnings, different hopes, different dreams." Jimmy Carter [31]

1.4. Student mobility in Europe

In order to understand student mobility, we first need to define the notions of international and foreign students, displayed in Figure 5. The UNESCO Institute of Statistics defines international students as those "who have crossed a national or territorial border for the purposes of education and are now enrolled outside their country of origin," [30, p. 19]. The EU offers its definition of transnational education referencing "all types of higher education study programs, or sets of courses of study, or educational services (including those of distance education) in which the learners are located in a country different from the one where the awarding institution is based," [32, p. 108]. According to the OECD Indicators, foreign students are those who do not hold a citizenship in the country where they are studying, yet they might have been there for a long time, or even be born in the given country. International students can be seen as a subgroup of the former student population, ones who left their home countries with the primary purpose to study in another country [21]. Both foreign and international students

can be viewed as mobile students, in contrast to national, or domestic students [12], who are not internationally mobile.

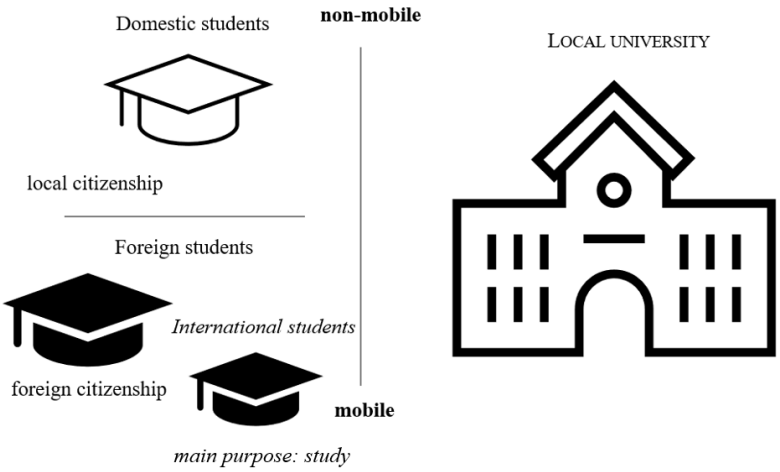


Figure 5. Domestic, foreign, and international students (source: author)

In the European region, a strong interconnectedness can be observed. While students from all over the world choose one of the European countries to continue their studies, there is also vast mobility within the region itself [19]. In 2020, 58% of the international students originated from Asia. Europe is the second largest region in which international students originate from, with 21% of all mobile students arriving from one of the European countries. However, it is also noted that European students prefer to stay in Europe [33].

Studying abroad is a great opportunity for students in many aspects. They have access to high quality HE and acquire skills which might not be available to learn or harder to access in their home countries, such as adaptability and building international connections and professional networks [21], [33]. Economic (cheaper living and tuition fees) and political conditions (stable political system) also play a role in students' decision [33]. Moreover, better job opportunities and competitiveness in the globalised labour market are important prospects. The interest in other cultures and the desire to improve one's language skills are further motivating factors [12], [33]. Improving one's English skills is especially important for international students [34]. Having a good command of the English language, the *lingua franca* of the globalised world [33], could prove immense benefits in the labour market. Mobile students, in most cases (unless they earn some form of scholarship), pay for their education, which is an important income

source for HEIs in host countries [35], [36], [37]. Their living expenses (accommodation fees, travel, food, and various services) are an important part of the local economy's income [21], [38]. Cray et al. highlight that students enrolling in HE already have some perceptions of teaching and learning processes, based on their previous educational experiences [39]. Yerken and Nguyen Luu emphasise the increasing awareness of cultural differences in the educational processes due to the increasing number of international students in HE [40]. Shkoler et al. compiled a list of different factors and changes, which affected and increased the number of international and foreign students. These changes range from the changing attitudes and characteristics of generations through migration and demographical alterations to the advancement of technology. Furthermore, personalised programmes and different supporting practices play a role in creating an enticing HE atmosphere for prospective students. Good quality infrastructure, financial, professional, and social support, tuition fees and the prestige and peer appraisal of the HEI are several other important factors which can affect the decision of international students. It is important to note, however, that there are many factors, which can bear a negative impact on the adjudication of the HEI, such as a distinct lack of internationalisation or discrimination due to race or religion [12].

Choudaha differentiates three major waves in international student mobility. During the first wave, HE aimed to attract the most talented students worldwide. This notion changed following the economic recession, when international students became an important source of income, thus making their recruitment vital for economic reasons [41], therefore universities had to switch to market-oriented approaches [42]. The third wave is mostly characterised by the demographic changes and the appearances of new destinations among international students [41].

De Wit et al. point out that throughout Europe, a major factor influencing international students' decision regarding the target country is related to tuition fees. Student mobility was enforced in the EU in 1987, when the European Action Scheme for the Mobility of University Students (ERASMUS) was initiated [43]. According to Lányi and Pozsgai, the most important characteristics of the European Higher Education Area include the following: comparable degree system, undergraduate and graduate education systems, credit system, equal rights in mobility, joint quality assurance and the establishment of the scope of a European HE [42].

1.5. Medical education in Europe

Medical education is expensive, yet important due to the increasing demand for doctors worldwide [44]. These programmes are a great source of income for HEIs, as the "suppliers", proven by frequent studies [35], [37]. However, the perceptions and expectations of the "consumers", tend to be assessed with less vigour.

Medical education in English is offered by numerous universities in Europe, in countries like the United Kingdom, the Czech Republic, Italy, and Hungary. Germany and the Netherlands are also popular destinations for international students, yet only a handful of universities offer education in English, with the majority of the studies are provided in German and Dutch, respectively. International students can apply at 38 medical schools in the UK. However, admission is very competitive, students who leave secondary education with exceptional academic achievements get accepted most of the time. Universities in the Czech Republic are quite popular among international students, with high ranks in international rankings. Italy offers the cheapest medical education in Europe, but the living costs are very high, and only a limited number of seats are available for international students. In Hungary, all four medical schools offer programmes in English, and these institutions are among the most popular destinations of German students. Other countries, e.g., Germany and the Netherlands, also offer medical education in English, although only at a few universities. In Germany, medical education is generally offered in German, with a few exemptions (e.g., Universitätsmedizin Neumarkt a.M., Hamburg). In the Netherlands, international students could pursue their studies in English at the University of Groningen or at Maastricht University [45].

International medical students gain invaluable experiences in different healthcare systems, broadening and enhancing their global perspectives, cultural awareness, and professional development.

1.6. International students in Hungary

We can observe in Figure 6. that Hungary ranks 10th amongst the OECD countries with the biggest share of international or foreign students at tertiary levels in 2020, high above the OECD average. In the academic year 2019/2020, 36.090 international students were studying throughout Hungary.

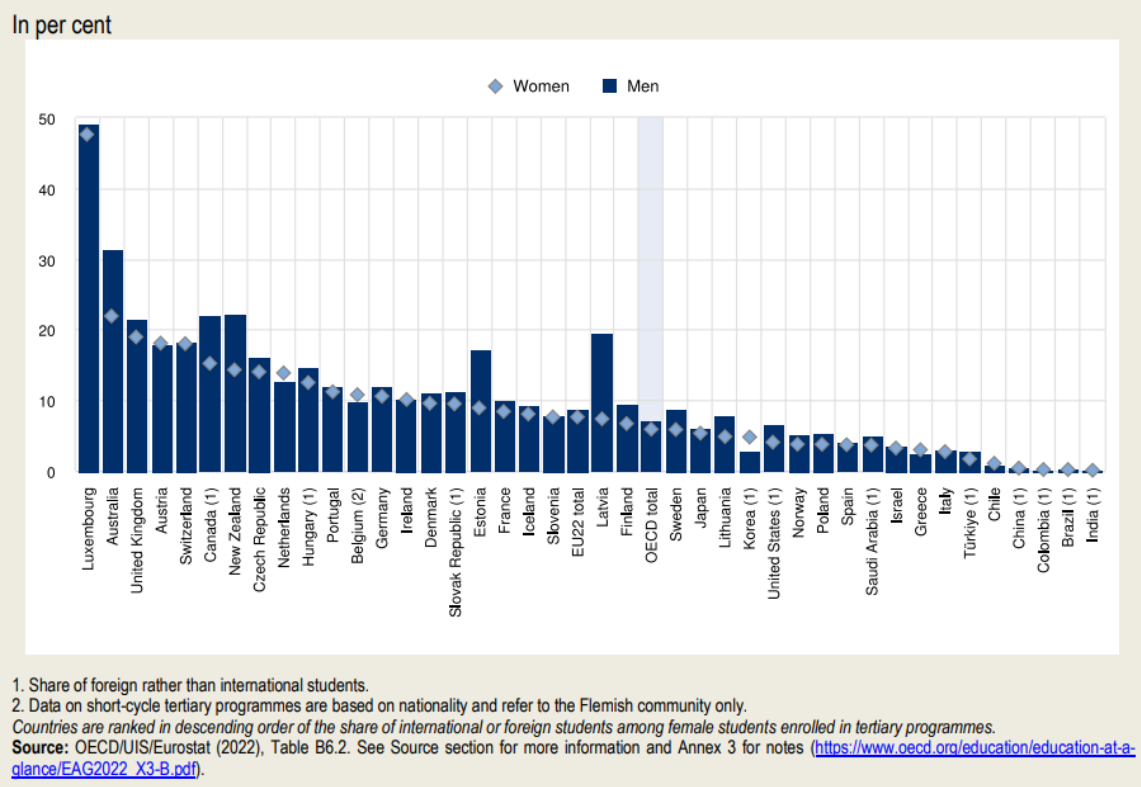


Figure 6. Share of international or foreign students at tertiary levels, by gender (2020) [33]

Hungarian HE experienced a democratic transformation in 1993, however, internationalisation remained a slow, enduring process [46]. The increase regarding internationalisation can be explained by the adaptation of the Bologna Process in 1999, with the intention to create comparable and permeable systems in HEIs [41], followed with the country's admittance to the European Union (EU) in 2004. With the emergence of new educational strategies, funds received from the EU and different scholarship programmes, the internationalisation of Hungarian HEIs significantly accelerated [40].

According to Kéri's research, the following factors bear the utmost importance for international students in choosing their HEIs: the international recognition of the university and the host city, the enrolment and tuition fee and the quality of local student life. It is also imperative that the degree awarded by the HEI is recognised in other countries [34].

In Hungary, the ratio of international and foreign students has been steadily increasing in the past decades, from 6.1% in 2011 to 9.6% in 2016 in HE [47]. Their numbers showed an increasing tendency from 11.187 in the 2001/2002 academic year to a total of 17.112 during the academic year of 2011/2012 [48]. Table 2. indicates the steady increase in the percentage

of international and foreign students in total tertiary enrolment, from 5% in 2010 to 13% in 2019 [21].

International or foreign student enrolment as a percentage of total tertiary enrolment

Reading the sixth column of the upper section of the table (international): 28% of all students in tertiary education in Australia are international students and 18% of all students in tertiary education in Switzerland are international students.

Reading the sixth column of the lower section of the table (foreign): 3% of all students in tertiary education in Greece are not Greek citizens, and 3% of all students in tertiary education in Korea are not Korean citizens.

		Number of international or foreign students (in thousands)	International or foreign student enrolment as a percentage of total tertiary enrolment							Percentage of national tertiary students enrolled abroad	Number of international or foreign students per national student abroad	Number of international or foreign students for every hundred national students home and abroad	Percentage of international or foreign students coming from neighbouring countries	International education market shares
			Short-cycle tertiary	Bachelor's or equivalent	Master's or equivalent	Doctoral or equivalent	All tertiary							
			2019				2019	2014	2010	2019				
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
		International students												
OECD	Countries													
	Australia	509	33	17	56	36	28	18	21	1	39	39	3	8
	Austria	75	1	18	23	36	18	15	14	6	3	20	58	1
	Belgium[1]	52	8	7	19	23	10	11	7	3	3	11	45	1
	Canada	279	21	13	19	34	16	10	m	3	6	19	3	5
	Chile	10	1	0	3	18	1	0	m	1	1	1	27	0
	Denmark	32	11	6	20	37	10	10	7	2	6	11	37	1
	Estonia	5	a	7	16	22	11	4	2	8	1	11	38	0
	Finland	24	a	6	11	24	8	7	6	4	2	8	12	0
	France	246	3	7	13	38	9	10	m	4	2	10	13	4
	Germany	333	0	7	16	12	10	7	9	4	3	11	14	5
	Hungary	35	1	10	20	23	13	7	5	5	3	14	21	1
	Iceland	2	36	5	11	38	8	7	5	14	1	8	8	0
	Ireland	25	5	8	23	33	11	7	m	7	2	11	8	0
	Israel	11	m	3	5	8	3	3	1	4	1	3	6	0
	Japan	203	9	3	10	20	5	3	m	1	6	5	53	3
	Latvia	8	1	8	23	11	10	5	2	6	2	11	15	0
	Lithuania	7	a	4	12	10	6	3	1	9	1	6	15	0
	Luxembourg	3	10	24	78	87	49	44	m	77	0	22	51	0
	Mexico	33	0	1	2	8	1	0	m	1	1	1	48	1
	Netherlands	108	2	11	19	m	m	10	4	m	m	m	26	2
	New Zealand	53	18	18	36	50	21	19	14	2	10	26	6	1
	Norway	12	1	2	7	22	4	4	3	6	1	4	12	0
	Poland	55	0	3	5	3	4	2	1	2	2	4	67	1
	Portugal	36	7	6	12	31	10	4	3	6	2	10	3	1
	Slovenia	5	3	6	8	19	7	3	2	13	0	6	47	0
	Spain	77	1	1	11	18	4	2	3	2	2	4	28	1
	Sweden	31	0	3	12	35	7	6	m	3	2	7	19	1
	Switzerland	56	0	10	29	56	18	17	15	6	4	20	54	1
	United Kingdom	489	‡	15	36	41	19	18	16	2	12	23	10	8
	United States	977	2	4	13	25	5	4	3	1	10	5	5	16

Table 2. International and foreign student mobility in tertiary education (2010-2019) [21]

This study focuses on specific, yet major subgroups of international students, i.e., those enrolled in medical education, the most frequently chosen field of study in HE in reference to internationally mobile students studying in Hungary [42].

1.7. International medical students in Hungary

The continuous increase of world population puts tremendous pressure on health systems. The struggle in health and welfare was further emphasised during the COVID-19 pandemic [33], thus medical education bears an utmost importance. Huhn et al. highlight that the fourth most attractive field of study for international students is health and welfare. However, international students face many challenges when they enrol in another country's education system. Apart from emotional factors (e.g., homesickness), they also face a deluge of stress and loss of social contacts [49].

In Hungarian HE, a continuous decline can be observed in the number of domestic students. To contest the decline in the domestic student population, HEIs made an effort to fill the available, vacant capacities with international and foreign students [42], [50], [51]. HEIs also must face decreasing governmental funds and increasing operational costs, therefore the presence of international and foreign students holds vast economic relevance [19], [42], [51]. Among international students, the most popular fields of study in Hungary include general medicine and dentistry, in which both English and German language programmes are available and have been for over 30 and 15 years, respectively [42], [51]. Thus, the number of international students showed a steady, and somewhat greater increase than their domestic, Hungarian peers [50], as depicted in Figure 7. [47].

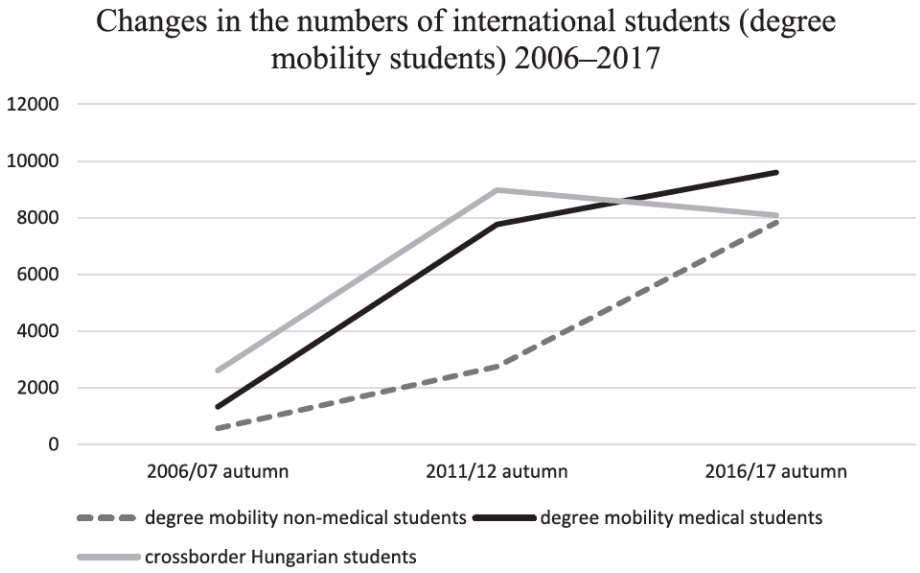


Figure 7. Changes in the numbers of international students in Hungary (2006-2007) [47]

1.8. Learning environment and the Dundee Ready Education Environment Measure

Walsh et al. point out the increasing attention medical education has been receiving, especially regarding its effectiveness, generated by the growing need of human resources in healthcare [52]. "Learning environment" (LE) or "education environment" (EE) is a complex term difficult to define [53], [54]. As Soemantri et al. explain, LE is one of the most important aspects influencing students' behaviour and achievements [55]. It is centred upon the learner and consists of a multitude of factors affecting students during their studies, ranging from physical attributes (such as structures, environments, and classrooms) to social and psychological effects (teachers, peers). This study views the LE in a similar manner. Figure 8. summarises these factors, which are all intertwined, forming the environment in which learning takes place, thus having a tremendous influence upon the process [54]. A positive and supportive LE can have a positive impact on the achievement of students, therefore its importance is not to be overlooked [56], [57], [58], [59]. Jármai and Végh add that motivation can also be enforced by an effective LE. One good example would be the facilitating attitude of educators, that could have a positive effect on the intrinsic motivation of students [60].

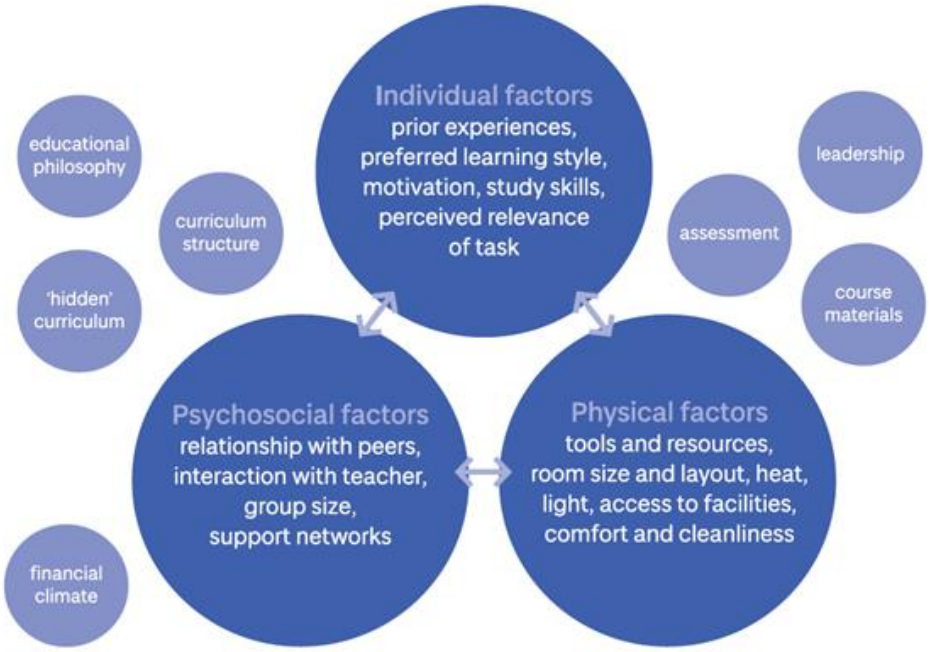


Figure 8. Factors contributing to the learning environment [54]

Oven et al. explain that international students enrol in a HEI's programme with existing preconceptions and expectations about the quality of education [61]. The assessment and evaluation of the LE is paramount towards delivering the best and finest education possible at universities, to discover the strengths and weaknesses and remedy the latter in the most effective way [62]. LE can be measured, and these measurements are imperative towards gaining insights into areas in dire need for improvement [62], [63]. LE was featured among the top factors for evaluating medical education programmes by the World Federation for Medical Education [55]. The DREEM inventory was designed and tailored for this exact purpose [64].

The development and validation of the Dundee Education Environment Measure (DREEM) was carried out at the University of Dundee, at a centre prioritising in medical education, in 1997, using a Delphi panel and involving international medical educators [65]. The DREEM is best suited for the evaluation of the LE in medical schools [66], since it can display areas of success and aspects ripe for improvement [67]. It is not linked to a specific culture and is generic, by nature, therefore, its use is ideal worldwide [68].

The DREEM inventory includes fifty questions grouped into five categories: Students' Perceptions of Learning (SPL); Students' Perceptions of Teachers (SPT); Students' Academic Self-Perceptions (SASP); Students' Perceptions of Atmosphere (SPA); Students' Social Self-Perceptions (SSSP) [67], displayed in Figure 9. The first category, SPL, is centred around the learning process, debating on whether it is stimulating, student-centred and well-focused, among other aspects. SPT focuses on teachers, e.g., their professional knowledge and communication skills. SASP revolves around learning strategies, preparedness and confidence of the students, and SPA enquires about students' social conditions, including their accommodation, social life, and the support system available at their universities.

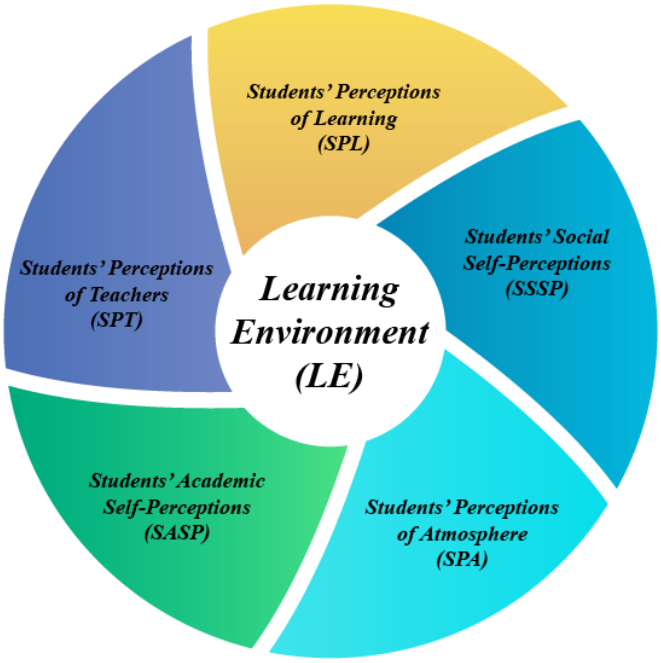


Figure 9. DREEM subcategories (source: author)

It was adapted in multiple languages (including Arabic, Chinese, Greek, Malay, Norwegian, Spanish, Swedish, Portuguese and Thai [69]), and has been effectively implemented in several medical schools spanning twenty countries [53], [62]. Chan et al. collected the articles which utilized the DREEM inventory. The articles were dated between 1997 and 2017. The systematic review included 106 studies, which were conducted in more than 30 countries, mostly in Asia and Europe. Medical, dental, and nursing programmes were included. 80% of the studies, which reported total DREEM scores, were equal to a "more positive than negative" evaluation according to the DREEM scores [70].

DREEM has been employed in many countries, including, but not limited to the following: Australia, Brazil, Canada, Chile, China, India, Iran, Ireland, Japan, Malaysia, Nepal, Nigeria, Saudi Arabia, Singapore, Sweden, Turkey, and the UK. Most of the articles involved undergraduate medical students as participants [62].

Hammond et al. commend the DREEM inventory as one suited to appraise LE in medical education. There is, however, some criticism in connection with the DREEM survey. The subscales show a great variety of questions, therefore their internal consistency appear rather low in many cases [57]. Miles et al. also raise an issue regarding the interpretation and analysis of the DREEM results. In most surveys, both parametric and non-parametric tests have been

employed, yet there is no central consensus on which statistical report would be the best to interpret the results [62].

All things considered, the DREEM inventory is still suitable for the comparison between medical schools, yet, as Hammond et al. emphasise, the five categories, in which the fifty questions are organised, are variable, and the basic concept in support of the subscales are not well supported [57]. Notwithstanding, the overall internal consistency of the DREEM inventory is reported to be quite high (the Cronbach's α coefficient > 0.7) [58].

1.9. Objectives

Many surveys have been conducted to measure students' perceptions regarding LE, as the literature review indicates, yet similar studies are quite scarce throughout Hungary. A cross-sectional study was carried out at the University of Szeged to assess the mental health of international students [71]. However, most universities conduct feedback assessments, which involve the entire student population, including but not limited to international students. In 2019, the DREEM questionnaire was used at the Semmelweis University [72]. The attrition of medical students, including international medical students was also measured during a longitudinal research study [73]. However, no study has been specifically conducted regarding the international medical students' perceptions on their LE at a national level, in the scope of the four medical schools throughout Hungary.

The objective of this dissertation is to assess and evaluate international medical and dentistry students' perceptions regarding LE at the four medical schools throughout Hungary, to identify the strengths and potential areas of development of the Hungarian medical education and to reveal any differences in attitude compared with the domestic, Hungarian medical and dentistry student population.

1.10. Hypotheses

International medical and dentistry students enrolled in either the English or German programmes may have prior experiences with formal education, which differ greatly when compared with Hungarian students. In order to gain insight into the perceptions of students enrolled in Hungarian medical schools, the following five hypotheses were formulated:

H1: The perception of international medical and dentistry students regarding their LE in Hungary is worse than their Hungarian peers'.

H2: Regarding their LE, there is no significant difference between the perceptions of medical and dentistry students studying in the English and German programmes.

H3: International and Hungarian medical and dentistry students with lower academic and social self-perceptions have lower perceptions of learning, teachers, and atmosphere at the medical schools throughout Hungary.

H4: International and Hungarian medical and dentistry students, with lower academic and social self-perceptions, studying in either the English, German, or Hungarian programme, demonstrate no significant difference between their perceptions of learning, teachers, and atmosphere at the medical schools throughout Hungary.

H5: The perception of international and Hungarian medical and dentistry students, studying in the first three academic years, is lower regarding their LE than their peers', studying in the last three years throughout Hungary.

2. Materials and methods

2.1. Mixed-method research

Due to the complexity of the topic and armed with the purpose of gaining a holistic understanding, both qualitative and quantitative investigations were undertaken [74]. A mixed-method cross-sectional research was carried out from April 2022 through November 2022. The collection of data occurred within the same time period [75]. Analysis of the results began in November 2022.

Some of the advantages of mixed-method studies include the greater validity and comprehensive outcomes they provide through the analysis of both quantitative and qualitative data. Furthermore, mixed-method researches might answer questions that quantitative or qualitative methods alone would not be able to. However, limitations of the mixed-method approach also need to be mentioned. Some researchers believe that quantitative and qualitative methods should not be mixed due to their different natures, and it might be too difficult for one researcher to employ both to their fullest extent, as a considerable amount of time and resources might be required [76].

In order to collect quantitative data, the DREEM questionnaire was utilised (see Appendix). Written approval was sought and obtained from Dr. Sean McAleer, one of the authors of the DREEM questionnaire, from the Hungarian Medical Research Council (see Appendix), and from the Rector's Cabinet, University of Pécs. The DREEM inventory consists of fifty questions, and for each question, a five-point Likert scale was offered, with the range spanning from one to five (one=strongly disagree, two=disagree, three=neutral, four=agree, five=strongly agree). All fifty questions were mandatory to complete [67]. There were nine questions regarding biodata and current studies at the beginning of the questionnaire, and five additional, open-ended questions concluded the survey. Completing the latter group of questions was optional. The objective of these open-ended questions was to gain a more thorough insight into the students' personal experiences, positive/negative stories they were willing to share and to provide students an opportunity to add comments they found relevant regarding the LE or the questionnaire itself. The questionnaire was compiled and made accessible online, in Google Forms.

Simultaneously, preparations were made for the semi-structured interviews with the purpose to gain a deeper insight into the topic. Relying on purposive sampling, educators, clinical doctors, dentists (who participated in ward instructions), and administrators were sought out and invited to partake in the interviews. Ten questions were asked during the semi-structured interviews (see Appendix), which took place in person or online, on one of the platforms suited for video conferences (Microsoft Teams, Zoom, and Skype).

Participation in both the quantitative and the qualitative part of the research was completely voluntary, all participants of the online questionnaire and the interviewees received the necessary information about the purpose of the study, anonymity, confidentiality, and data protection were assured.

2.2. Data collection

The DREEM questionnaire was pre-tested with the help of sixteen students from the English (N=14) and Hungarian (N=2) programmes in March 2022. The questions were in English and not translated into German or Hungarian, as Hungarian medical students have a very good command of English, since it is an obligatory language to study in Hungarian medical schools. Additionally, a high majority of German students speak English fluently, as it often is their first foreign language. Nonetheless, it was imperative to examine whether the questionnaire was clear and easy to understand regardless of students' mother tongue. The other reason for using the original English version of the DREEM was that the results should be comparable with other DREEM surveys conducted throughout other countries. The results of the pre-test gave no indication of any language related problems, thus only some minor modifications were made based on the feedback of the pre-testing sixteen students. The time required for completion was also measured [77] which was five to ten minutes, in most cases.

The questionnaire was finalised in Google Forms, an online platform suitable for compiling and sharing surveys, in April 2022. An email was sent to the Deans of the four Medical Schools in Hungary requesting assistance and support in carrying out the research. Each email included the link of the questionnaire, which was later distributed among the students using various channels (e.g., Facebook posts or messages via the Neptun Unified Education System).

Results of the questionnaire were analysed, first following the guidelines proposed by the authors of the DREEM [67], using Microsoft Excel to calculate the necessary values, then secondly, with the Kruskal-Wallis and Mann-Whitney U tests, in which $p < 0.05$ was regarded as significant. The Kruskal-Wallis test, which is optimal for the comparison of more than two independent samples [78], was used to compare the three language programmes (analysing the English and German programme separately) and the year groups. The Mann-Whitney U test was utilised in the comparison of the language programmes, in which the English and German programmes were viewed jointly as, "international", compared with the domestic, Hungarian student population. IBM SPSS Statistics for Windows, version 21 (IBM Corp., Armonk, N.Y., USA) was used for the statistical analyses.

Semi-structured interviews were conducted, to effectively acquire information from other perspectives and to supplement the quantitative data [79]. Purposive sampling technique was

applied, the participants of the semi-structured interviews were selected deliberately, based on their field of expertise, competences, and roles in the Medical Schools. In the case of interviews, the criteria meant how closely they worked among international medical and dentistry students (administrators, educators, and clinical doctors who undertook ward instruction) and had an overview and opinion regarding the learning environment. Individuals best suited to respond to the questions were identified, and other important factors, such as availability and willingness to participate, were also taken into consideration [80]. The list of questions (see Appendix) for the interviews were carefully compiled, with the purpose to gain the widest range of thoughts possible about the learning environment at the four Medical Schools, then pre-tested by one educator and one administrator, in June 2022. Interviewees could appraise the learning environment, including the physical aspects, teaching methods, and share their views on how the LE affected the medical students. Responses were transcribed, then coded and prepared for analysis with the aid of Sketch Engine, a corpus-based text analysis software.

Ethics approval was granted by the Medical Research Council (reference number: IV/2562- 3 /2022/EKU, see Appendix), and by the Rector's Cabinet, University of Pécs. Throughout the course of the study the principles of the Declaration of Helsinki were followed in strict accordance.

3. Results

3.1. Demographic profile

Comprehensively, 1164 medical and dentistry students enrolled in either the English, German or the Hungarian programmes of the four medical schools throughout Hungary participated in responding to the questionnaire. The response rate was close to 7%, since overall, there were approximately 15.900 international and Hungarian medical and dentistry students enrolled throughout the country, based on the student statistics acquired from the Dean's Offices of the University of Pécs Medical School (UPMS) and Szeged, and also from data available on the websites of the four medical schools [81], [82], [83], [84].

Relying on the assistance and support granted by the four Deans of the Medical Schools, participants were reached via the Neptun Unified Education Systems at the four Medical Schools, and through various other channels, including Facebook posts. The highest number of responses were from UPMS, as the research was conducted there. Therefore, due to the uneven distribution of responses and in pursuance of ensuring the highest level of anonymity, the individual numbers of answers from the four different medical schools are not displayed in this dissertation.

As presented in Table 3., the majority of respondents were women (62%) while men accounted for 36%. Additionally, 2% identified with, "prefer not to say" option. The ratio of the students studying medicine was 90% and 10% dentistry. Additionally, 47% were enrolled in the English, 10% in the German and 43% in the Hungarian programme. Groups in the English programme show a great variety in nationality and culture, while the German and Hungarian programme display a more homogeneous cultural profile. The majority of the respondents were between the ages of 21-25 (54%), those students 20 years old or below (38%), and only 8% were 26 years old or above. Most of the participants, (68%) were either in their first or second year (35% and 33%, respectively), 18% were in their third and 14% in their fourth, fifth or sixth years.

		N=1164	%
Gender	Man	417	36%
	Woman	728	62%
	Prefer not to say	19	2%
Language Programme	English	545	47%
	German	118	10%
	Hungarian	501	43%
Study Programme	General Medicine	1047	90%
	Dentistry	117	10%
Age	20 or below	443	38%
	21-25	636	54%
	26-30	66	6%
	31 or above	19	2%
Year of studies	1	405	35%
	2	391	33%
	3	205	18%
	4	85	7%
	5	55	5%
	6	23	2%

Table 3. Gender, programme, age and year of studies

Nationalities, native and other spoken languages were analysed and displayed in Table 27., in the Appendix. Figure 10. summarises the top ten nationalities and Figure 11. displays the top five native languages. Comprehensively, sixty-two different nationalities were represented in the survey. Most of the respondents, 43%, were Hungarian, 13% were Norwegian, 11% were German, followed by Iranian, Japanese, Jordanian, Chinese, Indian, Nigerian, and South-Korean students.

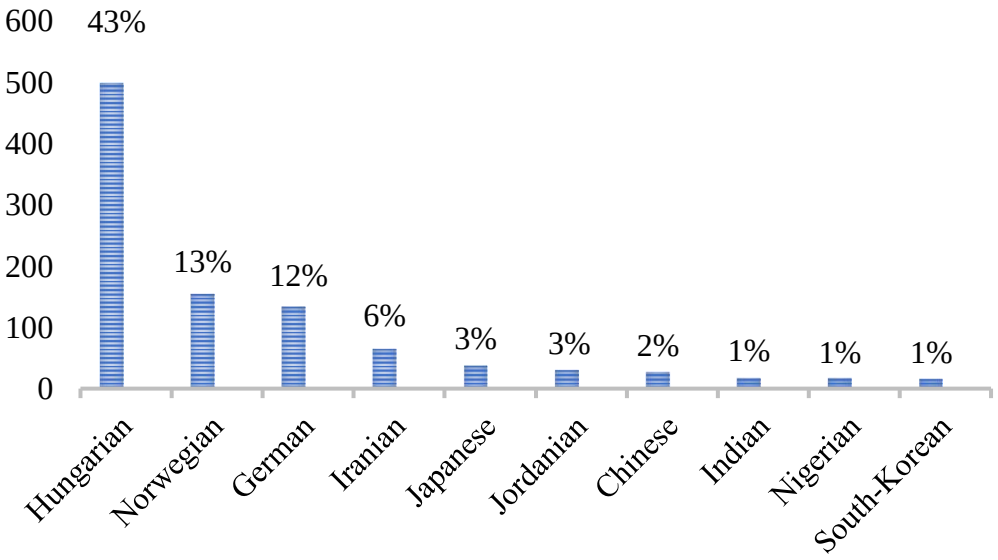


Figure 10. Top ten nationalities, N=995

As Figure 11. exhibits, 42% marked Hungarian, 11% declared German, and 11% indicated Norwegian as their native language. Additionally, Arabic and Persian languages were also indicated. A small fragment of the respondents (5%) had two, and five participants had three native languages. Fifty other languages were listed as other spoken languages, and five respondents declared that they only speak their native languages.

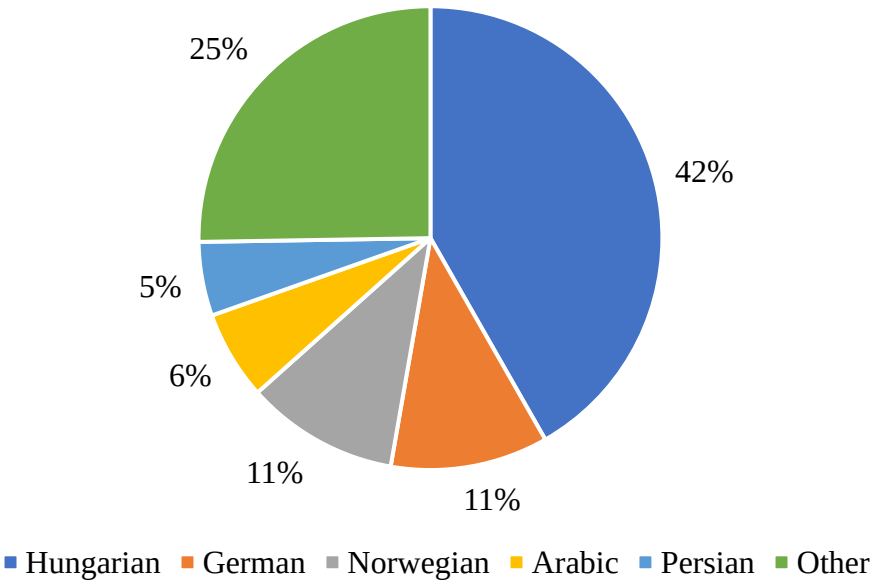


Figure 11. Top five and additional native languages, N=1164

3.2. Quantitative questionnaire (DREEM)

Data collected from the DREEM questionnaire was first converted into a Microsoft Excel spreadsheet. On initial analysis, scoring and interpretation guidelines proposed by the creators of the original research instrument were used, as displayed in Table 4. [67]. Additionally, means and standard deviations were calculated for each sub-category and reliability coefficient (Cronbach's α) was also calculated. Following these steps, non-parametric statistical tests were carried out to assess the differences between the student cohorts. Kruskal-Wallis tests were used in comparing the variables of the English, German and Hungarian programmes (EP, GP and HP, respectively), and the six year groups. The Mann-Whitney U test, which is suitable for the analysis of two groups with one variable [85], was also used for the comparison of language programmes, grouping EP and GP together as "international students" (I) and comparing the results with data gathered from Hungarian students.

DREEM main and subscales	Maximum scores	Interpretation
Overall score	50 items – 200 max score	0-50 - very poor 51-100 - plenty of problems 101-150 - more positive than negative 151-200 - excellent
Students' Perception of Learning (SPL)	12 items – 48 max score	0-12 - very poor 13-24 - teaching is viewed negatively 25-36 - a more positive perception 37-48 - teaching is highly thought of
Students' Perception of Teachers (SPT)	11 items – 44 max score	0-11 - abysmal 12-22 - in need of some retraining 23-33 - moving in the right direction 34-44 - model teachers
Students' Academic Self-Perceptions (SASP)	8 items – 32 max score	0-8 - feelings of total failure 9-16 - many negative aspects 17-24 - feeling more on the positive side 25-32 - confident

Students' Perception of Atmosphere (SPA)	12 items – 48 max score	0-12 - a terrible environment 13-24 - there are many issues which need changing 25-36 - a more positive atmosphere 37-48 - a good feeling overall
Students' Social Self-Perceptions (SSSP)	7 items – 28 max score	0-7 - miserable 8-14 - not a nice place 15-21 - not too bad 22-28 - very good socially

Table 4. Interpretation guide for the DREEM results [67]

3.3. Overall scores

The overall scores, calculated for each language programme, are displayed in Table 6. The total score was 120 out of the maximum 200, which falls into the "more positive than negative" category, according to the DREEM guidelines, displayed in Table 5. This score summarises the response of students in all language programmes. Cronbach's α was 0.92, which signifies an excellent internal consistency.

The total score for international students (including students in the English and German programmes) was lower than the overall result (118.1). When compared with international students, the result of the Hungarian student population was higher (122.6). This score was also higher than the total result. The lowest overall score was observed in the German programme (110.8). The total DREEM score in the English programme was higher (119.6) than the one observed in the German programme, although still below the total score including each language programme.

Results of the individual questions (average scores, standard deviations and medians with lower and upper quartiles) for the different language programmes can be observed in Table 28. (see Appendix). Responses for each language programme (I=International students, including participants of the English and German programme, EP=English Programme, GP=German Programme, HP=Hungarian Programme) were calculated separately, and the results were organised into five categories, adhering to the DREEM guidelines. Questions with negative evaluations are displayed in italics.

DREEM SCORES	TOTAL	I	EP	GP	HP	INTERPRETATION
TOTAL OF SCHOOL	120.0	118.1	119.6	110.8	122.6	more positive than negative
STUDENTS' PERCEPTIONS OF LEARNING	27.6	27.5	28.1	24.7	27.7	a more positive perception
STUDENTS' PERCEPTIONS OF TEACHERS	28.1	27.2	27.4	26.4	29.4	moving in the right direction
STUDENTS' ACADEMIC SELF-PERCEPTIONS	18.8	18.6	19.1	16.6	19.1	feeling more on the positive side
STUDENTS' PERCEPTION OF ATMOSPHERE	29.3	28.8	28.9	27.9	30.0	a more positive atmosphere
STUDENTS' SOCIAL SELF-PERCEPTIONS	16.2	16.0	16.2	15.3	16.4	not too bad

Table 5. Scores and interpretation of the results categorised by language programme (I=International students, EP=English Programme, GP=German Programme, HP=Hungarian Programme)

Table 6. displays the statistical analysis of the DREEM inventory and the reliability score of each question and category. Additionally, the number of responses and missing data are displayed. The average score, its standard deviation, median values with lower (Q1) and upper (Q3) quartiles can also be observed. The correlations between the items of the DREEM questionnaire are expressed with Cronback's α values. The value between 0.7-0.8 is considered acceptable, while lower scores represent problems with reliability, therefore results yielded in these categories should be treated with caution during analysis. Each category is analysed further below.

DREEM results and statistics					
Scale/item		**Scores**			
Question number	**DREEM questions**	**all data (missing data)**	**Mean (±SD)**	**Median (q1, q3)**	α
Students' Perceptions of Learning			**27.6±8.5**	**29(23,33)**	**0.873**
1.	I am encouraged to participate in classes.	1164 (0)	2.8±1.0	3(2,4)	0.863
7.	The teaching is often stimulating.	1164 (0)	2.3±1.0	2(2,3)	0.859
13.	The teaching is student centred.	1164 (0)	2.1±1.2	2(1,3)	0.854
16.	The teaching is sufficiently concerned to develop my competence.	1164 (0)	2.5±1.1	3(2,3)	0.856
20.	The teaching is well focused.	1164 (0)	2.5±1.0	3(2,3)	0.852
22.	The teaching is sufficiently concerned to develop my confidence.	1164 (0)	2.0±1.2	2(1,3)	0.858
24.	The teaching time is put to good use.	1164 (0)	2.4±1.1	2(2,3)	0.854
25.	*The teaching over-emphasises factual learning.*	1164 (0)	1.5±1.0	2(1,2)	0.896
38.	I am clear about the learning objectives of the courses.	1164 (0)	2.5±1.0	3(2,3)	0.862
44.	The teaching encourages me to be an active learner.	1164 (0)	2.3±1.2	2(1,3)	0.854
47.	Long term learning is emphasised over short term.	1164 (0)	2.4±1.2	3(2,3)	0.867
48.	*The teaching is too teacher-centred.*	1164 (0)	2.1±1.1	2(1,3)	0.875
Students' Perceptions of Teachers			**28.1±6.9**	**29(24,33)**	**0.818**
2.	The teachers are knowledgeable.	1164 (0)	3.3±0.8	3(3,4)	0.800
6.	The teachers are patient with patients.	1164 (0)	2.7±1.0	3(2,3)	0.795
8.	*The teachers ridicule the students.*	1164 (0)	2.3±1.2	2(2,3)	0.808
9.	*The teachers are authoritarian.*	1164 (0)	1.6±1.1	2(1,2)	0.820
18.	The teachers have good communications skills with patients.	1164 (0)	2.7±1.0	3(2,3)	0.793
29.	The teachers are good at providing feedback to students.	1164 (0)	2.2±1.1	2(1,3)	0.795
32.	The teachers provide constructive criticism here.	1164 (0)	2.2±1.1	2(1,3)	0.809
37.	The teachers give clear examples.	1164 (0)	2.6±1.0	3(2,3)	0.792
39.	*The teachers get angry in class.*	1164 (0)	2.9±1.1	3(2,4)	0.804
40,	The teachers are well prepared for their classes.	1164 (0)	3.0±0.9	3(3,4)	0.796
50.	*The students irritate the teachers.*	1164 (0)	2.6±1.2	3(2,4)	0.820
Students' Academic Self-Perceptions			**18.8±5.9**	**19(15,23)**	**0.797**
5.	Learning strategies which worked for me before continue to work for me now.	1164 (0)	2.3±1.1	2(2,3)	0.790
10.	I am confident about my passing this year.	1164 (0)	2.4±1.2	3(2,3)	0.794
21.	I feel I am being well prepared for my profession.	1164 (0)	2.5±1.1	3(2,3)	0.761
26.	Last year's work has been a good preparation for this year's work.	1164 (0)	2.4±1.2	3(2,3)	0.769
27.	I am able to memorise all I need.	1164 (0)	1.9±1.2	2(1,3)	0.768
31.	I have learned a lot about empathy in my profession.	1164 (0)	2.4±1.2	2(2,3)	0.777
41.	My problem solving skills are being well developed here.	1164 (0)	2.4±1.1	2(2,3)	0.766

45.	Much of what I have to learn seems relevant to a career in medicine.	1164 (0)	2.5±1.2	3(2,3)	0.772
Students' Perceptions of Atmosphere			**29.3±8.3**	**29(24,35)**	**0.838**
11.	The atmosphere is relaxed during the ward teaching.	1164 (0)	2.4±1.0	2(2,3)	0.820
12.	This school is well timetabled.	1164 (0)	2.0±1.2	2(1,3)	0.829
17.	*Cheating is a problem in this school.*	1164 (0)	2.6±1.3	3(2,4)	0.862
23.	The atmosphere is relaxed during lectures.	1164 (0)	2.6±1.1	3(2,3)	0.818
30.	There are opportunities for me to develop interpersonal skills.	1164 (0)	2.3±1.1	2(2,3)	0.817
33.	I feel comfortable in classes socially.	1164 (0)	2.8±1.1	3(2,4)	0.821
34.	The atmosphere is relaxed during seminars/tutorials.	1164 (0)	2.8±1.0	3(2,4)	0.818
35.	*I find the learning experience disappointing.*	1164 (0)	2.3±1.2	3(2,3)	0.830
36.	I am able to concentrate well.	1164 (0)	2.3±1.1	2(2,3)	0.829
42.	The enjoyment outweighs the stress of studying medicine.	1164 (0)	1.8±1.3	2(1,3)	0.823
43.	The atmosphere motivates me as a learner.	1164 (0)	2.4±1.2	3(2,3)	0.810
49.	I feel able to ask the questions I want.	1164 (0)	2.8±1.2	3(2,4)	0.824
Students' Social Self-Perceptions			**16.2±4.6**	**16(13,19)**	**0.651**
3.	There is a good support system for students who get stressed.	1164 (0)	1.7±1.2	2(1,3)	0.600
4.	*I am too tired to enjoy the courses.*	1164 (0)	1.7±1.2	2(1,2.5)	0.639
14.	I am rarely bored on the courses.	1164 (0)	1.8±1.1	2(1,2)	0.640
15.	I have good friends in this school.	1164 (0)	3.2±1.0	4(3,4)	0.608
19.	My social life is good.	1164 (0)	2.7±1.2	3(2,4)	0.556
28.	I seldom (rarely) feel lonely.	1164 (0)	2.1±1.3	2(1,3)	0.599
46.	My accommodation is pleasant.	1164 (0)	3.0±1.0	3(2,4)	0.651

Table 6. Total DREEM scores by subcategories (mean, median, q1, q3, α)

3.4. Students' Perceptions of Learning (SPL)

Total scores can be observed in Table 5., while Table 6. displays overall scores for each question. Scores measured in the three language programmes (EP, GP, HP) are displayed in Table 28. (see Appendix). The overall score regarding SPL was 27.6 out of 48, which is interpreted as a "more positive perception" [67]. The reliability score was good (α=0.873). Students in the English programme awarded the highest points (28.1). The lowest score was observed in the German programme (24.7).

"The teaching over-emphasises factual learning" ranked as the lowest mean value among the individual questions (1.4±1.0), Figure 12. depicts some selected scores in the various language programmes.

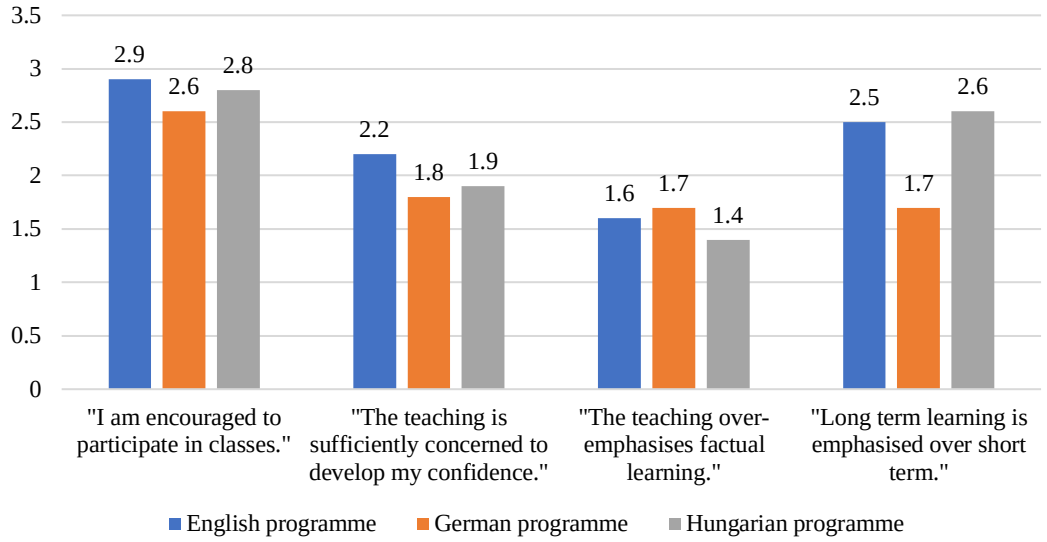


Figure 12. SPL, language programmes

Several students thought teaching was too teacher-centred (2.1±1.1), others, on the other hand, agreed that teaching was student-centred (2.1±1.2). *"The teaching is sufficiently concerned to develop my confidence,"* also received a lower score (2.0±1.2). When compared with Hungarian students, who did not feel that their confidence was being developed (1.9±1.2), international students felt more positive regarding the question (2.1±1.2). Students felt encouraged to actively participate in classes (2.8±1.0). German students did not think long-term learning was emphasised over short-term (1.7±1.2). Means in the German programme were generally lower than the total scores and scores in the other two language programmes, except for the over-emphasis of factual learning (1.7±0.9).

3.5. Students' Perceptions of Teachers (SPT)

Total scores can be observed in Table 5., while Table 6. displays overall scores for each question. Scores measured in the three language programmes (EP, GP, HP) are displayed in Table 28. (see Appendix). SPT achieved a total score of 28.1 out of 44 points, with good reliability (α=0.818), which means, according to student opinion, schools are "moving in the right direction" [67]. Interestingly, the highest total score was in the Hungarian programme

(29.4) and inexplicably, it was the lowest in the German programme (26.4). Each individual question received total points above 2.0, except the one concerning authoritarian teachers (1.6±1.1). The lowest mean value can be observed in the German programme referencing the aforementioned question. Students seemed to agree that teachers were knowledgeable (3.3±0.8) and well-prepared for their courses (3.0±0.9), as Figure 13. demonstrates.

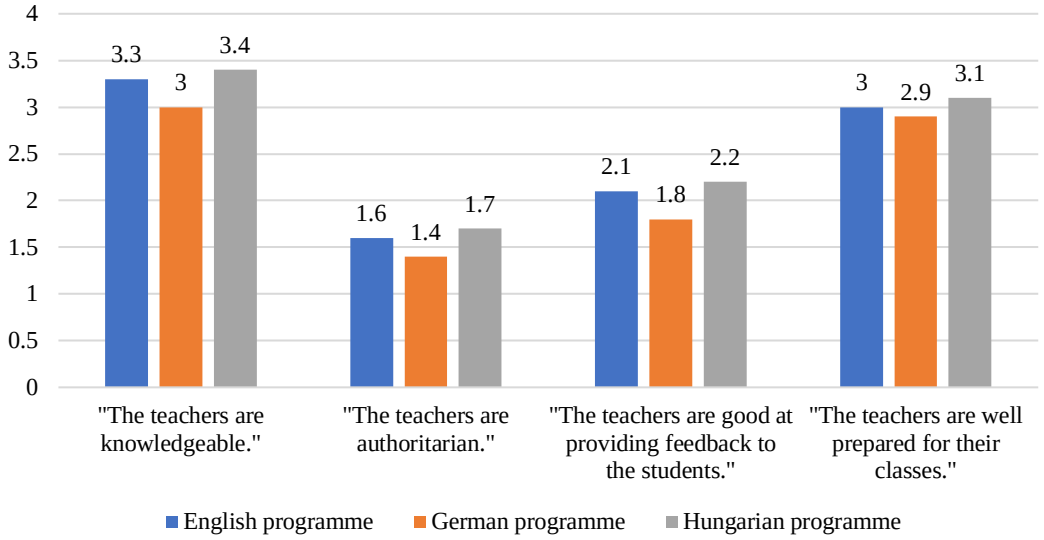


Figure 13. SPT, language programmes

Hungarian students' answers scored higher than international students' in all cases. The biggest difference between the two student groups was in reference to the question in which teachers express anger in class (in regards to the international students, the mean value was 2.7±1.2, for Hungarian students it was 3.2±1.0). Participants also found the feedback received from teachers lacking (EP: 2.1±1.2, GP: 1.8±1.0, HP: 2.2±1.1).

3.6. Students' Academic Self-Perceptions (SASP)

Total scores can be observed in Table 5., while Table 6. displays overall scores for each question. Scores measured in the three language programmes (EP, GP, HP) are displayed in Table 28. (see Appendix). The total result of the SASP category was 18.8 out of 32 points, with acceptable reliability (α=0.797). According to the DREEM interpretation guides, this means students are "feeling more on the positive side" [67]. The overall score in the Hungarian and English programme was the same (19.1), and the lowest result was observed in the German programme (16.6). The question with the lowest total score (1.9±1.2) concerned the

memorisation of all information (Figure 14.). Other scores were between 2.3-2.5. The highest total score (2.5±1.2) was given to the question referencing the relevance of studied information and its relationship to the medical profession.

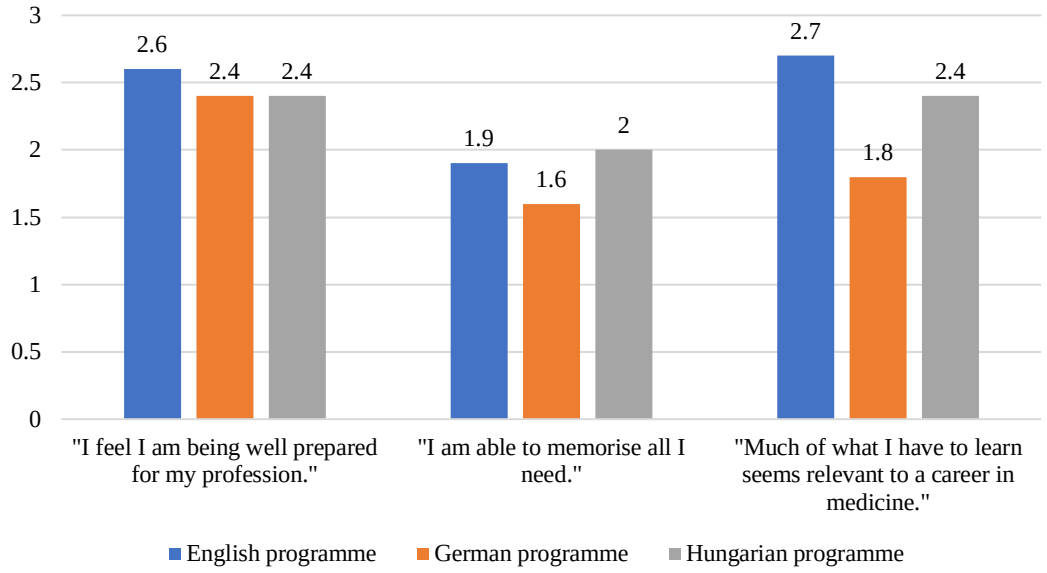


Figure 14. SASP, language programmes

International students were generally less content with their academic self-perceptions than Hungarian students. However, the former student population felt better prepared for their future profession (2.6±1.1) than their Hungarian peers (2.4±1.2). The highest score was observed in the English programme (2.6±1.2), shown in Figure 14. German students' perceptions were the lowest in all questions, compared with students in the English and Hungarian programmes. German students were unsure they could memorise all they needed (1.6±1.1), they were not positive that they learnt enough about expressing empathy (1.7±1.2) and they were not confident that everything taught was relevant for their future profession (1.8±1.3).

3.7. Students' Perceptions of Atmosphere (SPA)

Total scores can be observed in Table 5., while Table 6. displays overall scores for each question. Scores measured in the three language programmes (EP, GP, HP) are displayed in Table 28. (see Appendix). Out of the possible 48 points, SPA resulted in 29.3 with good reliability (α=0.838). This score translates as a "more positive atmosphere" [67]. The total results were the highest in the Hungarian programme (30.0) and lowest in the German

programme (27.9). The analysis of the individual questions indicated that students were unhappy with the timetable of the school (2.0±1.2), and they experienced increased levels of stress during their studies (1.8±1.3). On the other hand, students felt that the atmosphere was relaxed during seminars (2.8±1.0), and they felt socially comfortable during classes (2.8±1.1). The line item, *"I feel able to ask the questions I want"* [67] also received a high score (2.8±1.2), as exhibited in Figure 15.

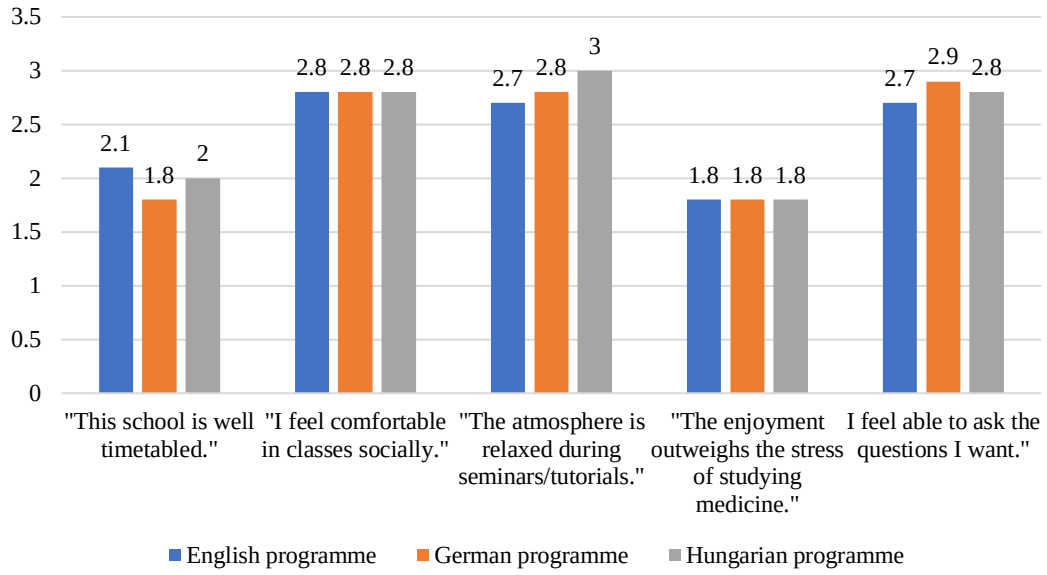


Figure 15. SPA, language programmes

International students expressed worse opinions regarding cheating (2.5±1.4) than their Hungarian peers (2.8±1.2). German students seemed the most unhappy with their timetables (1.8±1.2), displayed in Figure 15. They were also unsure whether the school could sufficiently develop their interpersonal skills (1.9±1.1). Students in all programmes agreed that they felt socially comfortable in classes (2.8±1.0 for EP, 2.8±1.1 for GP and 2.8±1.1 for HP). Hungarian students were the most positive regarding the relaxed atmosphere during seminars (3.0±1.0). The level of stress scores was also unanimous among the language programmes (1.8±1.3 for EP, 1.8±1.3 for GP and 1.8±1.2 for HP). German students were the most confident when asking questions during classes (2.9±1.2), followed by Hungarian students (2.8±1.1), and lastly, students in the English programme (2.7±1.2).

3.8. Students' Social Self-Perceptions (SSSP)

Total scores can be observed in Table 5., while Table 6. displays overall scores for each question. Scores measured in the three language programmes (EP, GP, HP) are displayed in Table 28. (see Appendix). The overall score for SSSP was 16.2 out of 28, with questionable reliability (α=0.651), which is interpreted as "not too bad" [67]. This score was the lowest in the German programme (15.3), followed by the English (16.2) and Hungarian programmes (16.4). Participants did not think the school had a good support system for stressed students (1.7±1.2), as observed in Figure 16. There was also an indication students felt too tired to appreciate courses to the fullest (1.7±1.2), and many were faced with boredom during the lessons (1.8±1.1). Conversely, students seemed to have good friends at their schools (3.2±1.0), their social life was good (2.7±1.2), and they were content with their accommodations (3.0±1.0).

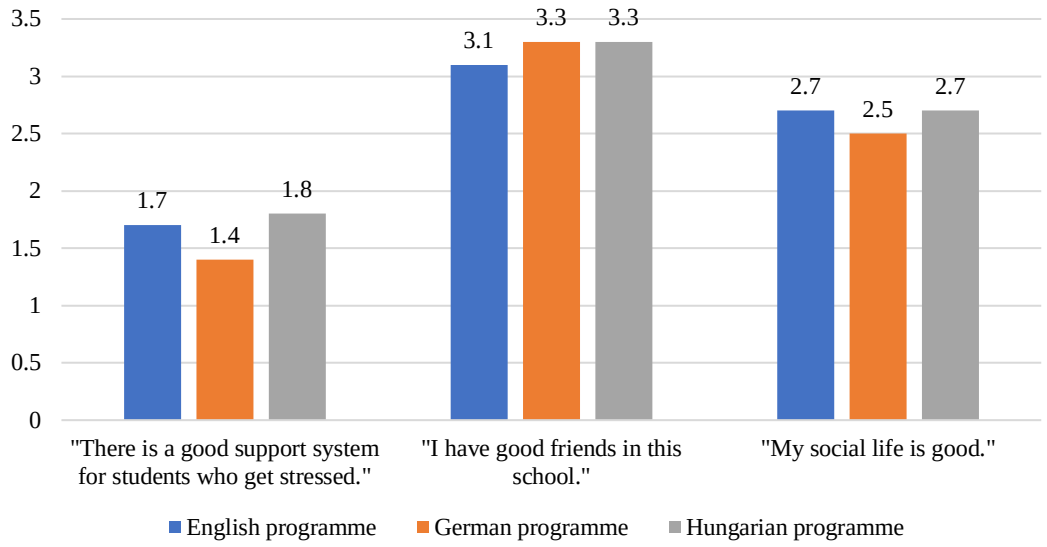


Figure 16. SSSP, language programmes

German students seemed to be the least satisfied regarding the support system at their schools (1.4±1.1), shown in Figure 16., and they had the lowest score regarding a good social life (2.5±1.3). Inversely, German students seemed to have good friends (3.3±1.0), and a similar score was observed in the Hungarian programme (3.3±1.0). German students also expressed pangs of loneliness (1.9±1.3), which seemed to be a less prevalent problem in the other two language programmes (2.1±1.3 for EP and 2.2±1.3 for HP).

3.9. Open-ended questions in the quantitative questionnaire

Five open-ended questions formed the last portion of the questionnaire. Responses to these questions were collected, coded, and organised according to the major and most frequent themes [86]. Next, these responses were classified with the help of Sketch Engine, a corpus-based text analysis software. Alongside the twenty most frequent keywords, five major themes were identified, which are displayed in Figure 17. with increased font size, concerning the 1. buildings and physical environment, 2. the language barrier, 3. mental health problems and stress, 4. the timetable, 5. communities and socialisation.

Figure 17. Most frequent terms, results of the open-ended questions (source: author)

1. Several students were dissatisfied regarding the condition of the buildings and the lack of places in which to comfortably study.

One student wrote, *"Few study places at the university is a major influence negatively."*

Another student commented, *"Parts of the school buildings are outdated and under equipped with tables and chairs. Too little place to sit down and study."*

One more participant added, *"There is not so much place to sit down on the campus for learning or doing something else, so sometimes we need to fight for place."*

Places where students could study were highly appreciated.

"There are various places to study in our school, places that are noisy and places that are quiet enough to hear a pin fall."

Classrooms were deemed too crowded and uncomfortable by some.

"The classrooms. Most of them are too dark with extremely uncomfortable chairs."

"It happened and still happening that, there are not enough space in the lecture room. Many times a lot of people have to sit on the floor and that is very annoying."

The short opening hours of the library were also mentioned.

"We don't have 24/7 open library. And the library we have sometimes closes early because of some parties. I think we need some place we can study whenever we want. Even it's not during the exam weeks."

2. Communication problems with teachers and administration staff due to the language barrier could be a serious issue on both sides. As one participant described the problem,

"Language barrier and how little some doctors pay attention to us international students during practices due to their low language skills."

Another student wrote, *"The lack of student support and administration support, there is a communication breakdown and teaching styles even within the same course from lecturer to lecturer. Inconsistency can also be viewed and felt during exams."*

Communication issues between teachers and administration, which affected students negatively, were also mentioned.

"Lack of communication between the teacher and the student. As well as the communication between the registrar's office and the clinical professors."

3. Students were not satisfied with the mental support they received at their schools, despite being under a considerable amount of stress during their studies.

"Lastly, a mental health resource would be of help to many students. Ideally, the above changes remove the stressors to the students' mental health condition enough, so that the need for a separate mental health resource is minimal."

4. The timetable was considered too crammed by the students, with little room for free time to study.

As one of the participants wrote: *"Timetable should me more flexible so that students actually have time to study."*

Another student commented: *"Less classes/reorganisation of timetable would be helpful, most of my days feel too crammed."*

5. Opportunities for socialisation were highly regarded, and some participants advocated forming specific (e.g., religious) communities.

A participant applauded the instances where students in the different language programmes could work together: *"Mixing Hungarian and international students to make friends also from country where studying. Teaching assistants and elective/optional courses."*

Another student proposed an idea of forming student communities: "*Creating a community of Christian medical students with the cooperation of the four medical schools would be definitely a good idea."*

Students were also asked to give account of their positive and negative experiences at their universities. Some praised the methods and teachers:

"At times, is quite engaging, especially during seminars (e.g., problem-solving questions and bonus quizzes allow us to keep up to date with lectures)."

"Enthusiastic teachers that want you to learn for the sake of learning, not for the sake of exams."

"The younger staff are very relatable and teach in a MODERN manner. They connect with us, empathize with our struggles, try to help us when we are in trouble or pain. Sadly, this school has only a hand full of young teachers as senior teachers with old mentalities are the majority."

"The teachers have exceptional knowledge on the subject which makes you feel more interested in the lectures."

"Our teachers are our future colleagues, and they mostly speak to us like capable, job-ready adults."

There were also some comments which intended to raise awareness of certain issues.

One of the participants wrote, *"I have seen many other instances of unprofessional behaviour, especially when professors are unaware of how much Hungarian we understand. There have been instances of professors telling each other that they will "mess with" a student mid exam, for their amusement."*

3.10. Semi-structured interviews

With the purpose of providing depth to the quantitative questionnaire, as part of the mixed-method research [74], a qualitative investigation was carried out. Semi-structured interviews were conducted (see Appendix for the list of the questions). Semi-structured interviews employ both closed- and open-ended questions. Why and how questions are poised as a means in which to follow-up, if the situation necessitates, and there is a certain freedom for the navigation within the topic of interest [79].

While relying on purposive sampling, which means the selection of the interviewees is based on a certain criterion [80], 17 individuals (5 male and 12 female) from the four medical schools were asked to participate in the semi-structured interviews. The participants were employed as clinical doctors, actively involved in ward teaching (N=5), educators (N=7), dentists, who also took part in teaching (N=2), and administrators (N=3) working with both Hungarian and international students. Participating in the research was voluntary, all interviewees were informed regarding the objective of the study and were assured protection, anonymity, and confidentiality of the data collected.

The interviews were digitally recorded, four interviews took place live, person-to-person, and 13 were recorded digitally on Microsoft Teams, Zoom, and Skype, since these participants were only available online. Live interviews were recorded with the aid of a digital voice recorder. The interviews generally took no longer than 20 minutes. Following the last interview, the recordings were transcribed and coded, grouped in appropriate categories, and analysed [86]. Major themes were identified utilising Sketch Engine, a corpus-based text analysis software. All interviews were originally conducted and analysed in Hungarian, and, as the final step, translated into English.

Among the twenty most frequent keywords, the following seven major themes were identified, visualised in Figure 18., displayed with increased font size: 1. number of students, 2. number of doctors/dentists/educators, 3. language barrier, 4. stress, 5. devices, 6. buildings and 7. classrooms. Quotes from the participants were selected, then translated into English, to further illustrate each topic.

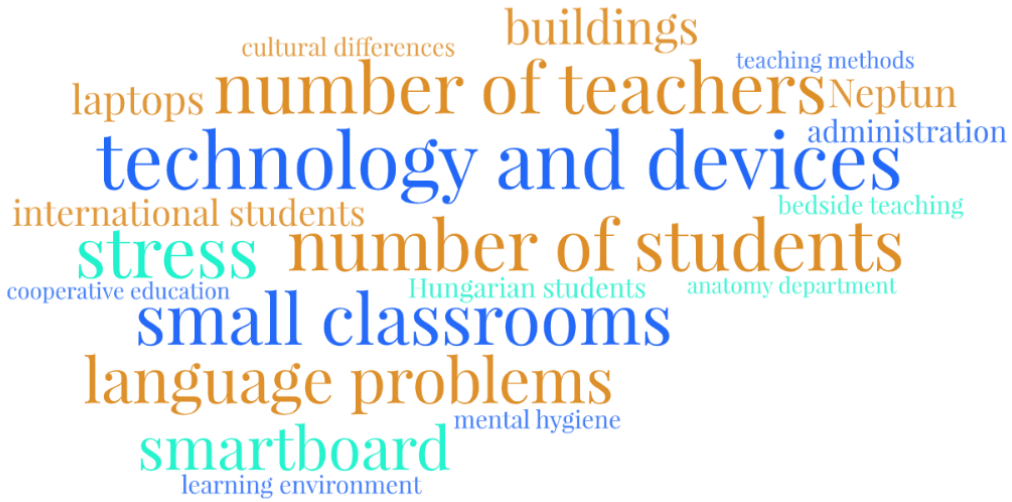


Figure 18. Most frequent terms, results of the semi-structured interviews (source: author)

1-2. Number of students and doctors/dentists/educators

Four clinical doctors, three educators, two dentists and one administrator remarked on the issue of an excess number of students without enough doctors/educators to teach. Groups were deemed too large, in which modern, inclusive, and interactive pedagogical methods could not be employed, as one of the educators mentioned. One of the dentists pointed out that the number of teachers was not increasing proportionally with the increased student population, which resulted in too many students per one teacher, except for several international student groups, which typically, tended to be smaller in number. Clinical doctors pointed out that they also had to carry out their duties at the ward, and teaching groups of students at the same time proved to be a tedious task.

One of the participants noted: *"Smaller group sizes would be much more ideal, and this would, obviously, have an impact on the efficiency of education for all students."*

Another interviewee added: *"(...) with fewer groups and personalized teaching, the quality of education could be greatly enhanced, but for that, we would need more instructors."*

The issue of the increasing number of students for the same staff was also raised: *"(...) the staff hasn't grown as much in the field (...). The increase hasn't been proportional, and as a result, instructors are overwhelmed with teaching responsibilities."*

One participant commended the smaller groups in international programmes: *"One positive aspect is that foreign language groups are very small compared to Hungarian ones. We can conduct practical sessions with only five, six, or a maximum of seven students."*

The troubles of holding ward practice while actively treating patients and managing daily responsibilities at the ward was also raised: *"Often I can't even sit down with students to go over the material, because I'm with patients in the operating room."*

"It's a huge task to send students to a healthcare system, an active functioning hospital or clinic, where there may not be enough resources to take care of them. I believe this aspect can always be improved."

3. Language barrier

Many participants commented on the language barrier and communication problems regarding international students. One educator proposed a stricter language knowledge assessment prior to admission, or a prospective preparatory year, dedicated mostly for language learning. One of the clinical doctors agreed that a certain level of language knowledge was essential for the international students to enable communication with patients.

One interviewee suggested: *"A one-semester or one-year language preparation would be good to at least help them with English, and it would be beneficial with Hungarian as well, as it is more difficult for them, but a little English training could also be helpful."*

4. Stress

Three educators and two administrators mentioned stress as a major factor observed in the student population. Opinions were divided regarding the motivation of international and Hungarian student groups, some participants deemed international, others identified Hungarian students as more motivated. It was also mentioned that international students had a tendency to act less politely in certain situations than their Hungarian peers.

Participants commented on the motivation of international and Hungarian students, and the level of stress that might affect them:

"We often discuss with colleagues how foreign students are usually more inclined to ask questions than Hungarian students. Even when given the opportunity, Hungarian students tend not to ask, whereas foreign students flood us with questions."

"Foreign students are much more interested and ask more questions, while Hungarian students tend to just sit and observe, and at most, they ask questions at the end. Foreign students are more interactive and direct."

"It's very challenging, particularly for international students who find themselves in a foreign environment (...)."

"I have a very positive overall impression. Especially when it comes to Hungarian students, but I also see that foreign students are often very diligent and make a great effort to catch up, even though stress is something I would highlight."

5. Devices

Satisfaction was quite high concerning the quality of equipment in which three clinical doctors, five educators and two administrators positively commented on the topic, yet a need for more digital instruments was also stated:

"Whiteboards and projectors are necessary for this, (...) we just need to improve them a little, but there usually aren't many complaints."

6-7. Buildings and infrastructure

Mixed opinions were expressed referencing the state of the buildings aligned to the medical school. An educator and an administrator pointed out the decrepit state of some parts of the building complexes, and the difficulties students faced while trying to navigate and find their classrooms throughout the school. Three educators, a clinical doctor, a dentist, and an administrator also highlighted that classrooms were too crowded and not suitable in teaching

large groups of students. A lack of common areas and places in which students could sit down to wait for their classes, study or just rest, was also pointed out by two dentists, a clinical doctor, and an administrator.

Participants made notes of the small classrooms, and the lack of common areas in educational buildings and clinics where students could sit down and wait:

"Sometimes there are so many students that it's difficult for them to fit into a smaller seminar room or even during practical sessions, smaller groups need to be formed, and they can't all participate at once, so they need to be taught in a rotating system."

"Sometimes students sit too close to each other, and it's not always ideal, so ensuring proper ventilation is necessary."

"Regarding the new clinic, I don't have any major problems. (...) What might be missing is a communal space where students can spend time between classes, for example, if they don't have time to go home or anywhere else."

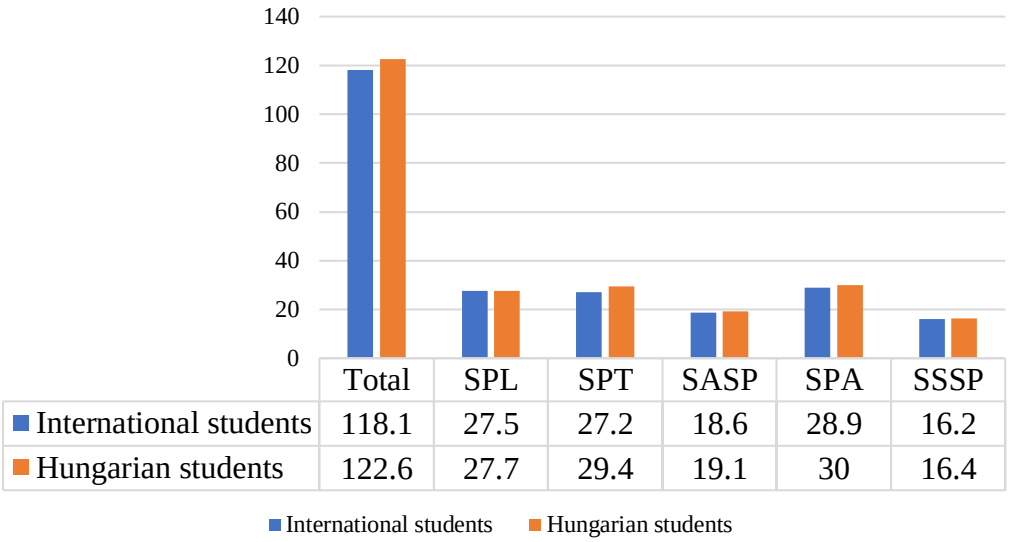
One educator proposed a closer collaboration between the four medical schools which could prove fruitful for the international reputation of medical education in Hungary:

"From the output perspective, I think it would be equally useful to have better practices shared among us, or to have a better understanding of each other."

3.11. Hypothesis testing

H1: The perception of international medical and dentistry students regarding their LE in Hungary is worse than their Hungarian peers'.

In order to verify the first hypothesis, the first step was to compare DREEM scores. Figure 19. displays the differences between the two student cohorts. While no stark differences can be observed in the figure, it is clear that the perceptions of international students are lower in all subcategories than their Hungarian peers'.



	Total	SPL	SPT	SASP	SPA	SSSP
International students	118.1	27.5	27.2	18.6	28.9	16.2
Hungarian students	122.6	27.7	29.4	19.1	30	16.4

Figure 19. DREEM scores of international and Hungarian students

The Mann-Whitney U-test was carried out for nonparametric analysis. Higher mean ranks signify better satisfaction with the given category, and mean ranks of the international students are lower in all subgroups, displayed in Table 7. Mean rank for students' perceptions of learning (SPL) was 576.87 for international, and 589.95 for Hungarian students. The perception of teachers mean rank for international students was 529.27, while the score in the Hungarian cohort was 652.95. Academic self-perception of international students was also lower (570.82, against 597.96 in the Hungarian programme). Perception of atmosphere was 557.81 in the international, and 615.17 in the Hungarian programme, and social self-perception score was 571.48 in the former, and 597.08 in the latter student group.

Ranks

	Int/Hun	N	Mean Rank	Sum of Ranks
SPL	Int	663	576.87	382466.00
	Hun	501	589.95	295564.00
	Total	1164		
SPT	Int	663	529.27	350903.00
	Hun	501	652,95	327127.00
	Total	1164		
SASP	Int	663	570.82	378452.00
	Hun	501	597.96	299578.00
	Total	1164		
SPA	Int	663	557.81	369828.00
	Hun	501	615.17	308202.00
	Total	1164		
SSSP	Int	663	571.48	378894.00
	Hun	501	597.08	299136.00
	Total	1164		

Table 7. Mann-Whitney U-test results for international and Hungarian students, by DREEM categories

Mann-Whitney U-test statistics can be observed in Table 8. for each DREEM subgroup. Significance level was $p<0.05$. Significant differences were found between the two student groups regarding perceptions of teachers ($p<0.001$) and perceptions of atmosphere ($p<0.004$).

Test Statistics[a]

	SPL	SPT	SASP	SPA	SSSP
Mann-Whitney U	162350.000	130787.000	158336.000	149712.000	158778.000
Wilcoxon W	382466.000	350903.000	378452.000	369828.000	378894.000
Z	-.658	-6.223	-1.366	-2.885	-1.289
Asymp. Sig. (2-tailed)	.511	<.001	.172	.004	.197

a. Grouping Variable: IntHun

Table 8. Mann-Whitney U-test statistics for international and Hungarian students, by DREEM categories

In conclusion, it can be stated that *H1 is partially confirmed, as DREEM scores observed in the international programme are lower than the results in the Hungarian programme,* although significant differences were only found in two DREEM categories (SPT, SPA). Mean ranks of each DREEM subgroup are also lower in the international student results than in the Hungarian

cohort. This finding is further supported by the negative z-scores of the Mann-Whitney U-test, which indicate higher scores in the second (Hungarian) group.

H2: Regarding their LE, there is no significant difference between the perceptions of medical and dentistry students studying in the English and German programmes.

For the sake of verifying H2, nonparametric Kruskal-Wallis tests were carried out to compare the language programmes. Each DREEM category was thoroughly analysed. Although not an integral part of H2, Hungarian programme was also included in the analysis, as H1 has indicated significant differences between the international (GP and EP) and the Hungarian programmes. In H1, however, GP and EP were analysed jointly, therefore individual differences were not indicated, thus the inclusion of HP in the verification process of H2. First, students' perception of learning was examined. Interquartile range is lower in the German programme than the English programme, shown in Figure 20. Sample average rank of the GP is lower (460.32) than the EP (602.11), seen in Figure 21. The difference between GP and EP is significant (p<.001), displayed in Table 9. Significant difference was found between GP and HP, too (p<.001).

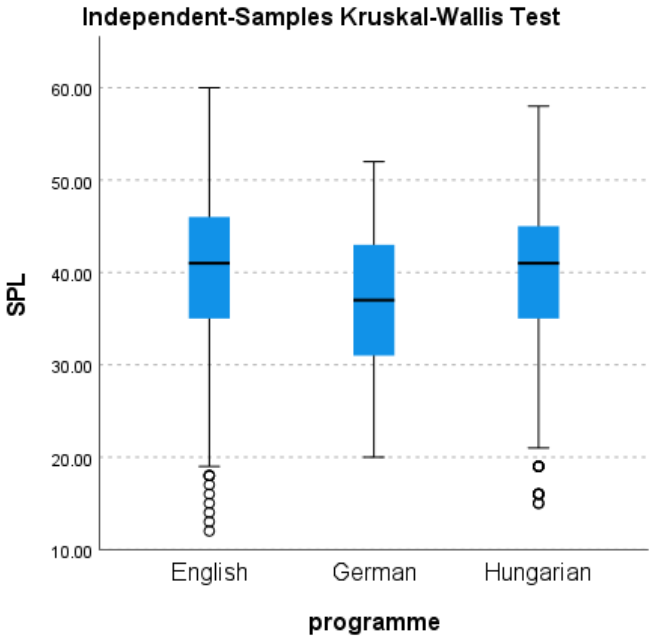


Figure 20. Comparison of programmes, SPL

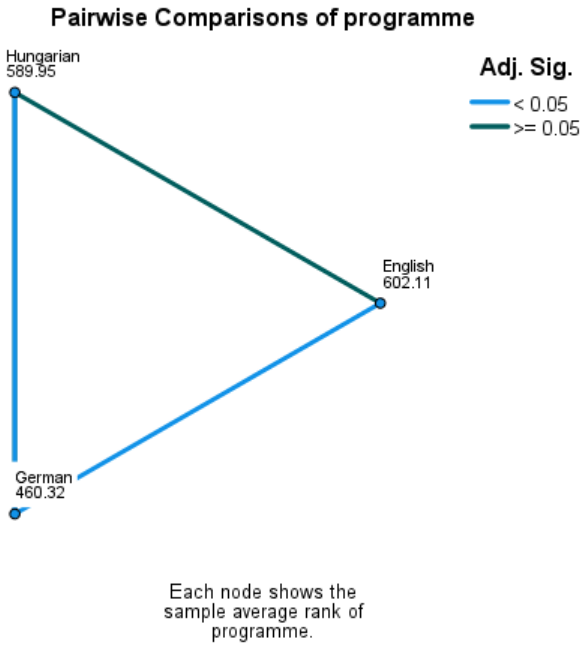


Figure 21. Comparison of programmes, SPL

Pairwise Comparisons of programme

Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig.[a]
German-Hungarian	-129.630	34.371	-3.771	<.001	.000
German-English	141.790	34.106	4.157	<.001	.000
Hungarian-English	12.159	20.790	.585	.559	1.000

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.

Asymptotic significances (2-sided tests) are displayed. The significance level is .050.

a. Significance values have been adjusted by the Bonferroni correction for multiple tests.

Table 9. Comparison of programmes, SPL

Secondly, students' perception of teaching was analysed. Interquartile range is lower again in the German programme than the English programme, shown in Figure 22. Sample average rank of the GP is lower (486.78) than the EP (538.47), seen in Figure 23. The difference between GP and EP was not significant, yet both programmes displayed a significant difference ($p<.001$), when compared with HP, as displayed in Table 10.

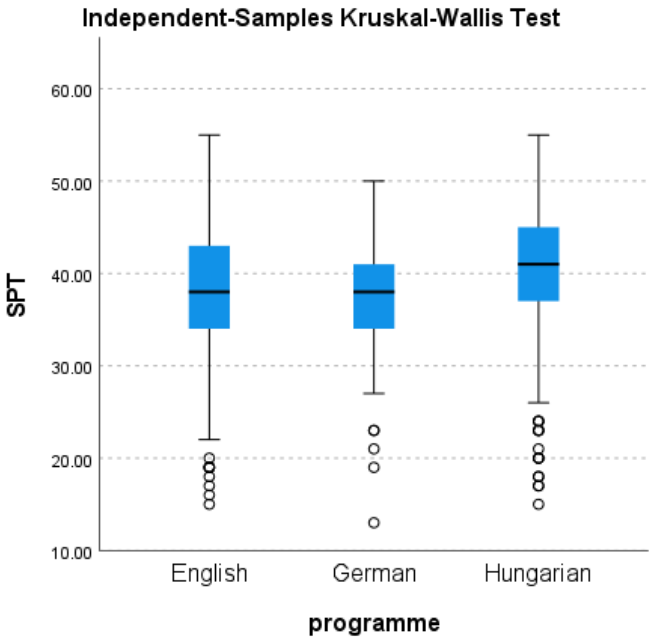


Figure 22. Comparison of programmes, SPT

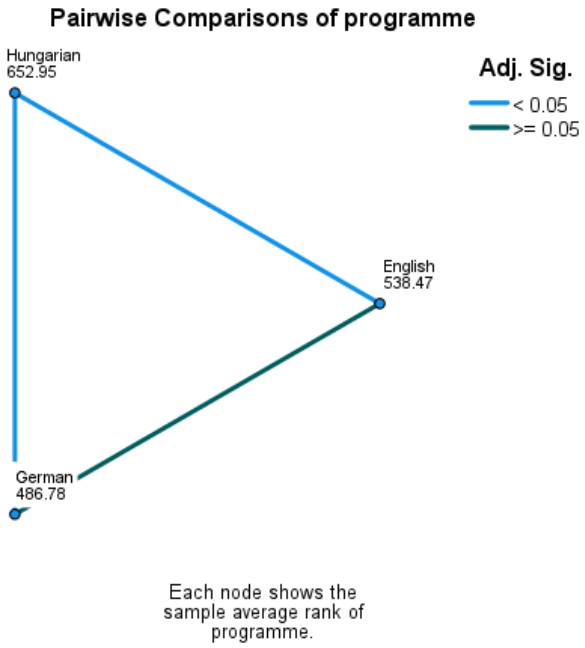


Figure 23. Comparison of programmes, SPT

Pairwise Comparisons of programme

Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig.[a]
German-English	51.690	34.092	1.516	.129	.388
German-Hungarian	-166.173	34.357	-4.837	<.001	.000
English-Hungarian	-114.483	20.782	-5.509	<.001	.000

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.

Asymptotic significances (2-sided tests) are displayed. The significance level is .050.

a. Significance values have been adjusted by the Bonferroni correction for multiple tests.

Table 10. Comparison of programmes, SPT

Next, students' academic self-perception was observed. Interquartile range is lower in this case, too, in the German programme than in the English programme, shown in Figure 24. Sample average rank of the GP is 456.64, lower than the EP (595.54), displayed in Figure 25. The difference between GP and EP is significant (p<.001), displayed in Table 11. Significant difference was found between GP and HP, too (p<.001).

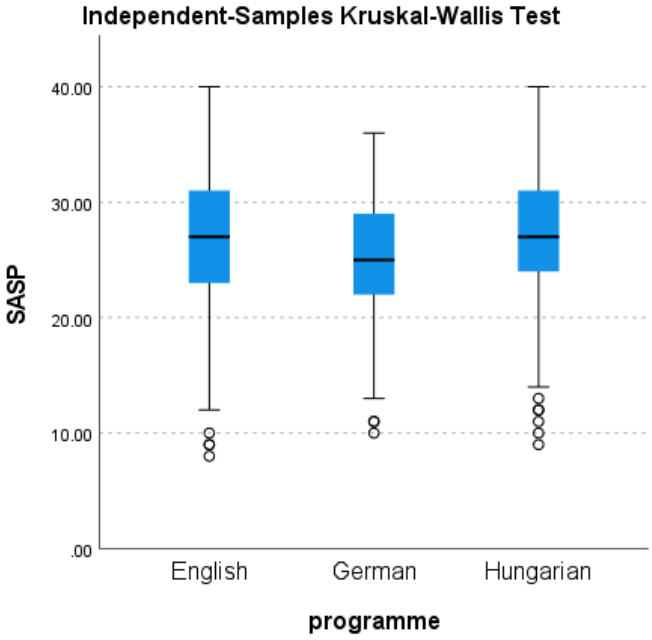


Figure 24. Comparison of programmes, SASP

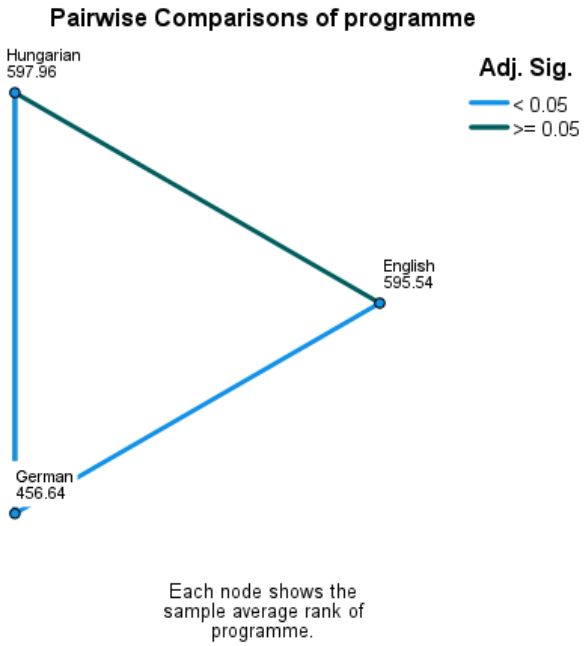


Figure 25. Comparison of programmes, SASP

Pairwise Comparisons of programme

Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig.[a]
German-English	138.899	34.085	4.075	<.001	.000
German-Hungarian	-141.320	34.350	-4.114	<.001	.000
English-Hungarian	-2.422	20.777	-.117	.907	1.000

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.

Asymptotic significances (2-sided tests) are displayed. The significance level is .050.

a. Significance values have been adjusted by the Bonferroni correction for multiple tests.

Table 11. Comparison of programmes, SASP

Students' perception of atmosphere was analysed next. Interquartile range has proven lower again in the German programme than in the English programme, shown in Figure 26. Sample average rank of the GP is lower (526.79) than the EP (564.53), although to a lesser extent, displayed in Figure 27. The difference between GP and EP is not significant in this case (p=0.269), as Table 12. depicts. However, significant difference can be observed between GP and HP (p=0.010), and between EP and HP (p=0.015).

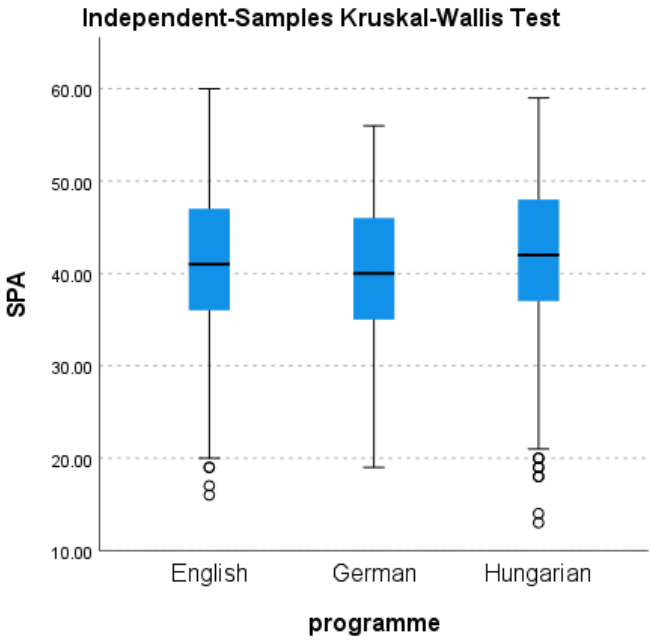


Figure 26. Comparison of programmes, SPA

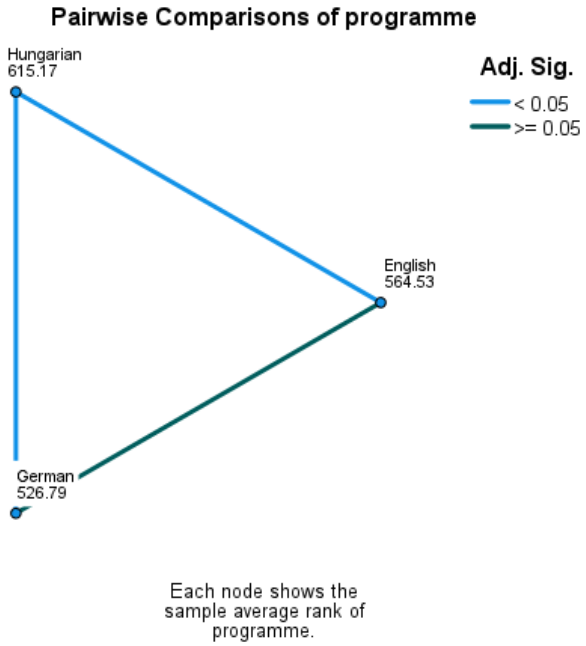


Figure 27. Comparison of programmes, SPA

Pairwise Comparisons of programme

Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig.[a]
German-English	37.738	34.108	1.106	.269	.806
German-Hungarian	-88.386	34.373	-2.571	.010	.030
English-Hungarian	-50.647	20.791	-2.436	.015	.045

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.

Asymptotic significances (2-sided tests) are displayed. The significance level is .050.

a. Significance values have been adjusted by the Bonferroni correction for multiple tests.

Table 12. Comparison of programmes, SPA

Lastly, students' social self-perception was analysed. Interquartile range is lower in the German programme than in the English programme, shown in Figure 28. The difference between GP and EP, displayed in Table 13., is significant (p=0.017). In addition, the difference between GP and HP is also significant (p=0.007).

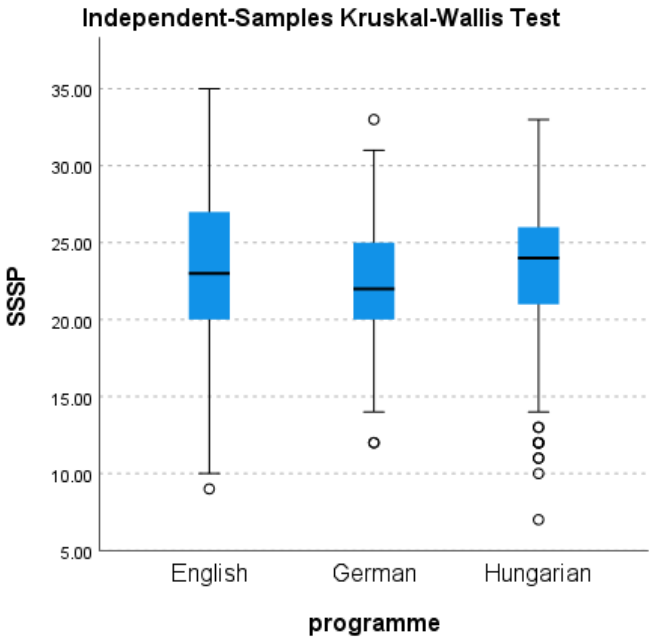


Figure 28. Comparison of programmes, SSSP

Pairwise Comparisons of programme

Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig.[a]
German-English	81.482	34.050	2.393	.017	.050
German-Hungarian	-92.574	34.315	-2.698	.007	.021
English-Hungarian	-11.092	20.756	-.534	.593	1.000

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.

Asymptotic significances (2-sided tests) are displayed. The significance level is .050.

a. Significance values have been adjusted by the Bonferroni correction for multiple tests.

Table 13. Comparison of programmes, SSSP

As has been demonstrated, *H2 must be rejected, as there are significant differences between the perceptions of students in the English and German programmes* concerning three out of the five DREEM subgroups (perception of learning, academic self-perceptions, and social self-perceptions). In the case of perception of teachers and atmosphere, although no significant differences were found, average ranks in the German programme are lower than in the English programme. Additionally, when comparing GP and EP to HP, significant difference was found between GP and HP in all DREEM categories, while EP and HP only displayed significant differences in two subgroups (perception of teachers and atmosphere).

H3: International and Hungarian medical and dentistry students with lower academic and social self-perceptions have lower perceptions of learning, teachers, and atmosphere at the medical schools throughout Hungary.

In the interest of testing H3, the lowest scores among students on the English, German and Hungarian programme in the academic and social self-perception categories were identified, collected, and analysed in Microsoft Excel (N=235). Lowest scores were set according to the DREEM guidelines, ≤16 for academic, and ≤14 for social self-perceptions. SASP in the "feelings of total failure" [67] and "many negative aspects" and SSSP in "miserable" and "not a nice place" [67] were considered. Results are exhibited in Table 14. The overall score for students with low SASP and SSSP was 83.4. During the statistical analysis, results were compared with students' scores (N=634) whose academic self-perception was above 16 (SASP>16), and social self-perception was above 14 (SSSP>14).

N=235	Mean±SD	Interpretation
SPL	18.6±7.5	teaching is viewed negatively
SPT	22.2±7.4	in need of some retraining
SASP	11.5±3.8	*many negative aspects*
SPA	20.4±6.9	there are many aspects which need changing
SSSP	10.6±2.9	*not a nice place*

Table 14. DREEM scores, SASP≤16 and SSSP≤14

For statistical analysis, a nonparametric test referred to as the Spearman Rank Correlation was conducted to measure the correlation between students' perception of learning, teachers, atmosphere, and academic and social self-perception. In pursuance of greater validity, source data was not limited to students with low academic and social self-perceptions, all participants were included in the analysis (N=1164). Positive numbers indicate a positive, while negative values indicate a negative correlation between the different items. Table 15. shows the confidence intervals of Spearman's rho. A positive, significant correlation was found between all DREEM categories (p<.001), therefore, it can be stated that higher academic and social self-perceptions presume higher perceptions of learning, teachers, and atmosphere, whereas students with lower perceptions in the former categories also have lower perceptions in the latter groups.

Confidence Intervals of Spearman's rho

	Spearman's rho	Significance(2-tailed)	95% Confidence Intervals (2-tailed)[a,b]	
			Lower	Upper
SPL - SASP	.731	<.001	.702	.758
SPL - SSSP	.611	<.001	.573	.647
SPT - SASP	.571	<.001	.529	.609
SPT - SSSP	.455	<.001	.407	.501
SASP - SPA	.733	<.001	.705	.760
SPA - SSSP	.679	<.001	.646	.710

a. Estimation is based on Fisher's r-to-z transformation.
b. Estimation of standard error is based on the formula proposed by Fieller, Hartley, and Pearson.

Table 15. Spearman Rank Correlation, DREEM subgroups (N=1164)

For further nonparametric analysis, a Mann-Whitney U-test was carried out. Higher mean ranks signify better satisfaction with the given category. Naturally, students with high satisfaction (SASP>16 and SSSP>14) displayed higher mean ranks than their peers who were less satisfied (SASP≤16 and SSSP≤14) with the HEI. Mean rank for students' perceptions of learning (SPL) was 167.79 for less content, and 534.04 for complacent students. The perception of teachers mean rank for students with low satisfaction was 221.91, while the score in the student cohort with higher satisfaction was 513.98. Academic self-perception of less satisfied students was very low (118.00, against 552.50 in the contented group). Perception of atmosphere was 159.39 in the less pleased, and 537.16 in the satisfied student population, and social self-perception score was 118.00 in the former, and 552.50 in the latter student group. This finding is supported by the negative z-scores of the Mann-Whitney U-test, displayed in Table 16., which indicate higher scores in the second (high satisfaction) group.

Ranks

	Perceptions	N	Mean Rank	Sum of Ranks
SPL	Low	235	167.79	39430.50
	High	634	534.04	338584.50
	Total	869		
SPT	Low	235	221.91	52150.00
	High	634	513.98	325865.00
	Total	869		
SASP	Low	235	118.00	27730.00
	High	634	552.50	350285.00
	Total	869		
SPA	Low	235	159.39	37456.50
	High	634	537.16	340558.50
	Total	869		
SSSP	Low	235	118.00	27730.00
	High	634	552.50	350285.00
	Total	869		

Table 16. Mann-Whitney U-test results for students with low (SASP≤16 and SSSP≤14) and high SASP>16 and SSSP>14) academic and social self-perceptions, by DREEM categories

Mann-Whitney U-test statistics are displayed in Table 17. for each DREEM subgroup. Significance level was $p<0.05$. Significant differences were found between the two student groups in all DREEM subcategories.

Test Statistics[a]

	SPL	SPT	SASP	SPA	SSSP
Mann-Whitney U	11700.500	24420.000	.000	9726.500	.000
Wilcoxon W	39430.500	52150.000	27730.000	37456.500	27730.000
Z	-19.122	-15.253	-22.699	-19.720	-22.720
Asymp. Sig. (2-tailed)	<.001	<.001	<.001	<.001	<.001

a. Grouping Variable: perceptions

Table 17. Mann-Whitney U-test results for students with low (SASP≤16 and SSSP≤14; N=235) and high (SASP>16 and SSSP>14; N=634) academic and social self-perceptions, by DREEM categories

In conclusion, it can be claimed that *H3 is confirmed, as international and Hungarian medical and dentistry students with lower scores in academic and social self-perceptions also have lower perceptions of learning, teachers, and atmosphere.*

H4: International and Hungarian medical and dentistry students, with lower academic and social self-perceptions, studying in either the English, German or Hungarian programme, demonstrate no significant difference between their perceptions of learning, teachers, and atmosphere at the medical schools throughout Hungary.

In pursuance of the verification of H4, DREEM scores of students in the English, German and Hungarian programmes with lower points in academic and social self-perceptions (SASP≤16 and SSSP≤14) were collected and analysed in Microsoft Excel (N=235). Scores of the five DREEM categories for each language programmes are displayed in Figure 29.

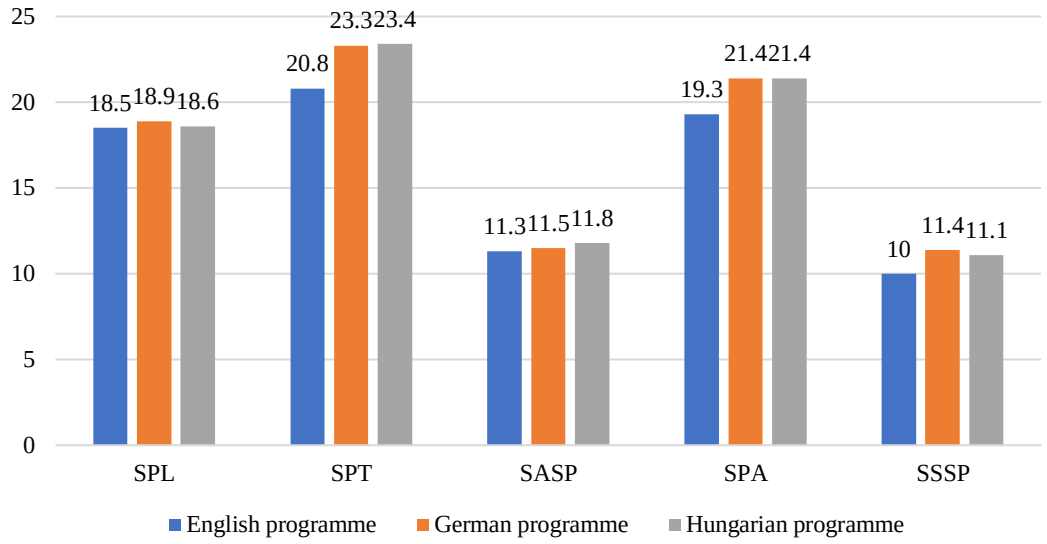


Figure 29. DREEM subgroup results, EP (N=108), GP (N=37) and HP (N=90), SASP≤16 and SSSP≤14

Total DREEM score in the English programme was 79.9, in the German programme 86.5, in the Hungarian Programme 86.3. Perception of learning scores were close in the three language programmes (EP: 18.5±7.3, GP: 18.9±6.1, HP 18.6±8.3). Perception of teachers, however, was the lowest in the English programme (20.8±7.0) whereas the score in the German programme was 23.3±6.9), close to the result observed in the Hungarian programme (23.4±7.7). Students' perception of atmosphere yielded almost the same results (EP: 11.3±3.9, GP: 11.5±4.1, HP: 11.8±3.6). Academic self-perception was, yet again, lowest in the English programme (EP: 19.3±6.2, GP: 21.4±6.3, HP: 21.4±7.8). Social self-perception was also the lowest in the English programme, although to a lesser extent (EP: 10±2.9, GP: 11.4±2.5, HP: 11.1±2.8).

The nonparametric Spearman's rho test was utilised again to measure the association between the language groups and DREEM categories. In pursuance of greater validity, all participants were included in the analysis (N=1164). Positive numbers indicate a positive, negative values indicate a negative correlation. As Table 18. displays, there is a positive, significant correlation between students' perception of teachers ($p<0.001$), perception of atmosphere ($p=0.017$) and the three language programmes.

Confidence Intervals of Spearman's rho

	Spearman's rho	Significance(2-tailed)	95% Confidence Intervals (2-tailed)[a,b]	
			Lower	Upper
programme - SPL	-.020	.493	-.079	.039
programme - SPT	.159	<.001	.101	.216
programme - SASP	.000	.990	-.059	.060
programme - SPA	.070	.017	.011	.129
programme - SSSP	.014	.639	-.045	.073

a. Estimation is based on Fisher's r-to-z transformation.
b. Estimation of standard error is based on the formula proposed by Fieller, Hartley, and Pearson.

Table 18. Spearman Rank Correlation, language programmes and DREEM subgroups (N=1164)

With the purpose to gain more insight into the differences between the language groups with lower points in academic and social self-perceptions (SASP≤16 and SSSP≤14), the nonparametric Mann-Whitney U-test was utilised. Better satisfaction is indicated by higher mean ranks. Noticeable differences can be observed in three subgroups (SPT, SPA, SSSP), displayed in Table 19. Mean rank for students' perceptions of learning (SPL) was 117.67 for EP, 116.64 for GP and 118.96 for HP. The perception of teachers mean rank for EP was 103.01, noticeably lower, than the other two groups (128.03 for GP and 131.87 for HP). Mean rank for students' academic self-perception was 114.74 for EP, 119.54 for GP and 121.28 for HP. Perception of atmosphere was 106.24 in the English, 131.18 in the German, and 126.69 in the Hungarian programme, and social self-perception score was 103.14 in the English 135.32 in the German, and 128.71 in the Hungarian student group.

Ranks

	Programmes	N	Mean Rank
SPLprogr	Eng	108	117.67
	Germ	37	116.64
	Hun	90	118.96
	Total	235	
SPTprogr	Eng	108	103.01
	Germ	37	128.03
	Hun	90	131.87
	Total	235	
SASPprogr	Eng	108	114.74
	Germ	37	119.54
	Hun	90	121.28
	Total	235	
SPAprogr	Eng	108	106.25
	Germ	37	131.18
	Hun	90	126.69
	Total	235	
SSSPprogr	Eng	108	103.14
	Germ	37	135.32
	Hun	90	128.71
	Total	235	

Table 19. Mann-Whitney U-test results for students in the three language programmes with low (SASP≤16 and SSSP≤14) satisfaction of academic and social self-perception, by DREEM categories

Nonparametric Kruskal-Wallis tests were carried out to compare the perceptions of the students in the three language programmes with low academic and social self-perceptions (N=235). A p value less than 0.05 was deemed significant. The three DREEM categories were analysed separately. Significant difference was found in three subgroups (p=0.007 for SPT, p=0.047 for SPA, and p=0.007 for SSSP), as displayed in Table 20.

Test Statistics[a,b]

	SPLprogr	SPTprogr	SASPprogr	SPAprogr	SSSPprogr
Kruskal-Wallis H	.035	9.829	.483	6.103	9.990
df	2	2	2	2	2
Asymp. Sig.	.983	.007	.786	.047	.007

a. Kruskal Wallis Test

b. Grouping Variable: programmes

Table 20. Kruskal-Wallis test results for students in the three language programmes with low (SASP≤16 and SSSP≤14) academic and social self-perceptions, by DREEM categories

First, students' perception of teachers was analysed. Interquartile range is lower in the English programme, compared with the German and Hungarian programmes, shown in Figure 30. The difference between EP and HP, displayed in Table 21., is significant (p=0.003).

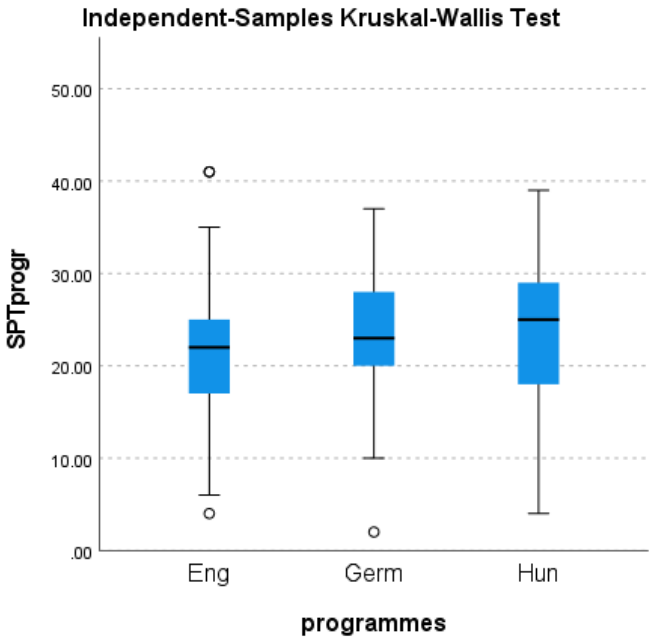


Figure 30. Comparison of programmes, SASP≤16 and SSSP≤14, SPT

Pairwise Comparisons of programmes

Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig.[a]
Eng-Germ	-25.018	12.931	-1.935	.053	.159
Eng-Hun	-28.857	9.689	-2.978	.003	.009
Germ-Hun	-3.840	13.257	-.290	.772	1.000

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.

Asymptotic significances (2-sided tests) are displayed. The significance level is .050.

a. Significance values have been adjusted by the Bonferroni correction for multiple tests.

Table 21. Comparison of programmes, SASP≤16 and SSSP≤14, SPT

Secondly, students' perception of atmosphere was analysed. Interquartile range is lower in the English programme than in the German and Hungarian programme, as displayed in Figure 31. The difference between EP and HP, shown in Table 22., is significant (p=0.035).

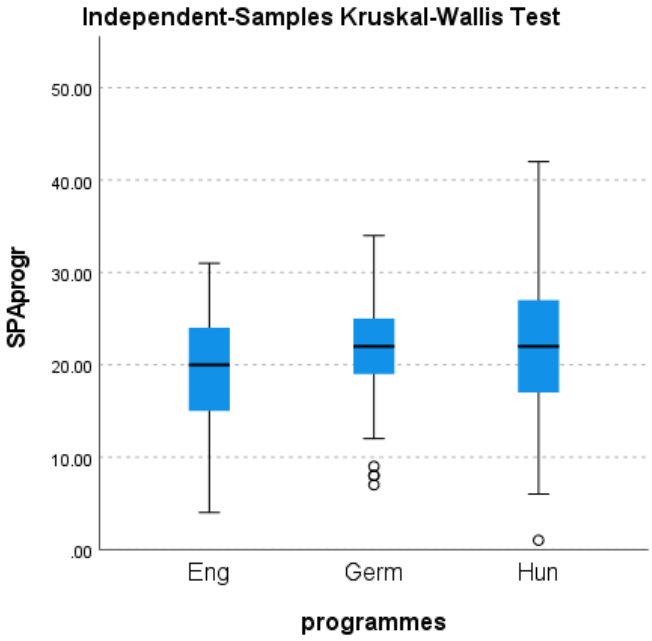


Figure 31. Comparison of programmes, SASP≤16 and SSSP≤14, SPA

Pairwise Comparisons of programmes

Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig.[a]
Eng-Hun	-20.444	9.691	-2.109	.035	.105
Eng-Germ	-24.930	12.935	-1.927	.054	.162
Hun-Germ	4.487	13.261	.338	.735	1.000

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.

Asymptotic significances (2-sided tests) are displayed. The significance level is .050.

a. Significance values have been adjusted by the Bonferroni correction for multiple tests.

Table 22. Comparison of programmes, SASP≤16 and SSSP≤14, SPA

Lastly, students' social self-perception was analysed. Interquartile range is, yet again, lower in the English programme than in the other two language programmes, exhibited in Figure 32. Significant difference was found between EP and HP (p=0.008) and EP and GP (p=0.012), displayed in Table 23.

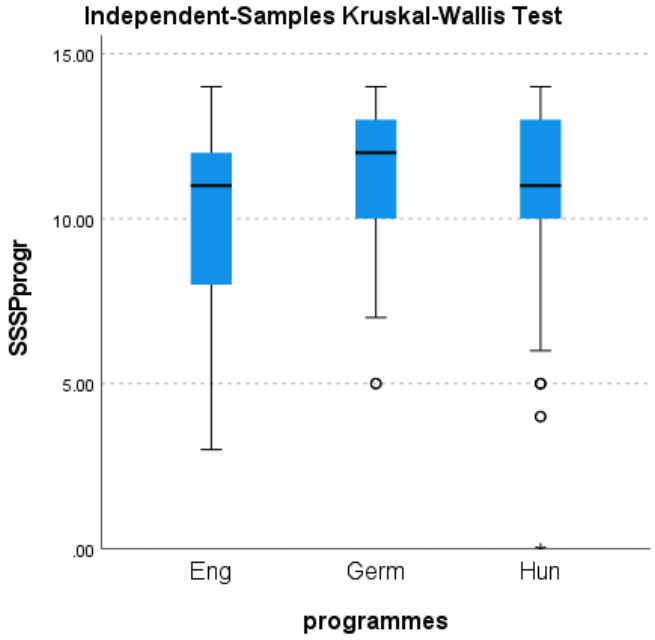


Figure 32. Comparison of programmes, SASP≤16 and SSSP≤14, SSSP

Pairwise Comparisons of programmes

Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig.[a]
Eng-Hun	-25.572	9.609	-2.661	.008	.023
Eng-Germ	-32.185	12.825	-2.510	.012	.036
Hun-Germ	6.613	13.148	.503	.615	1.000

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.

Asymptotic significances (2-sided tests) are displayed. The significance level is .050.

a. Significance values have been adjusted by the Bonferroni correction for multiple tests.

Table 23. Comparison of programmes, SASP≤16 and SSSP≤14, SSSP

As has been demonstrated, *H4 must be rejected, as there are differences between the perceptions of international and Hungarian medical and dentistry students with lower academic and social self-perceptions, studying in either the English, German or Hungarian language programme, concerning perceptions of learning, teachers and atmosphere,* the perceptions of the English student cohort being noticeably lower in two DREEM subgroups (perception of teachers, perception of atmosphere) than the German and Hungarian groups.

H5: The perception of international and Hungarian medical and dentistry students, studying in the first three academic years, is lower regarding their LE than their peers', studying in the last three years throughout Hungary.

In contemplation of testing H5, DREEM scores were sorted according to the students' years, including all three language programmes (N=1164). First to third year students were grouped together in one category, while the remainder of students further along in their studies were collected in the other category. Results were calculated according to the DREEM guideline [68], scores of the DREEM subgroups are displayed in Figure 33. Total score of students in Year 1-3 was 121.6, in Year 4-6 the overall result was lower (110.0). Scores in all DREEM subgroups were higher in Year 1-3. The two year groups exhibited the biggest differences in SPL (28.3±8.2 in Year 1-3 and 23.0±9.0 in Year 4-6), SPT (28.5±6.9 in Year 1-3 and 25.8±6.7 in Year 4-6) and SPA (29.7±8.3 in Year 1-3 and 26.7±7.8 in Year 4-6).

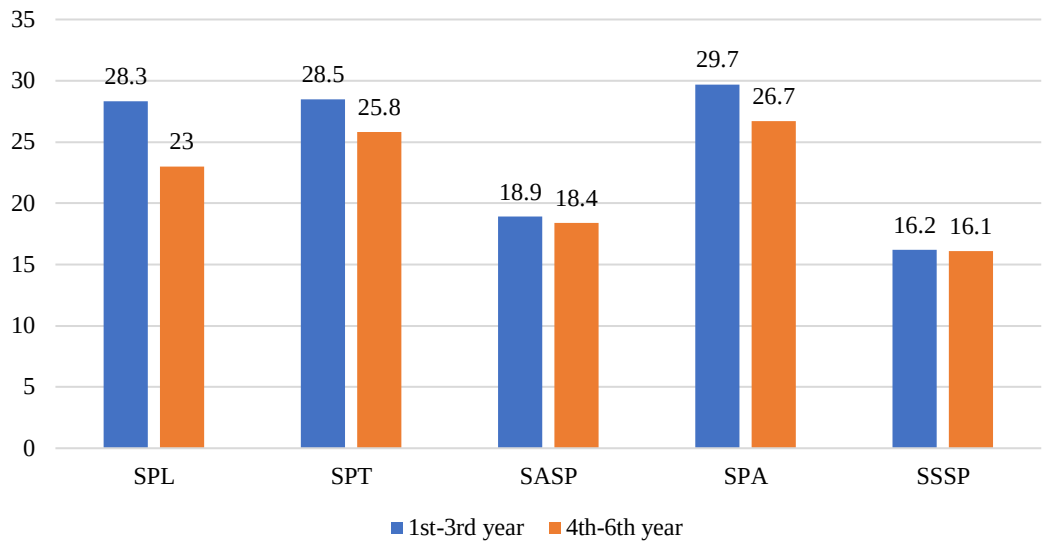


Figure 33. Scores of DREEM subgroups, by students' years

Next, nonparametric Kruskal-Wallis tests were performed to compare the perceptions of the year groups. A p value less than 0.05 was deemed significant. Each DREEM category was analysed separately. Interquartile range for SPL is decreasing with the years, as shown in Figure 34. Significant differences were found between Year 1 and all the other years (Year 1-Year 2: $p=0.002$, Year1-Year 3: $p<0.001$, Year 1-Year 4: $p<0.001$, Year 1-Year 5: $p<0.001$, Year 1-Year6: $p<0.001$). Other significant differences were found between Year 2 and Year 3, Year 4 and Year 6 ($p=0.005$, $p<0.001$, $p=0.005$, respectively). There was a significant difference between Year 3 and Year 5, too ($p=0.006$).

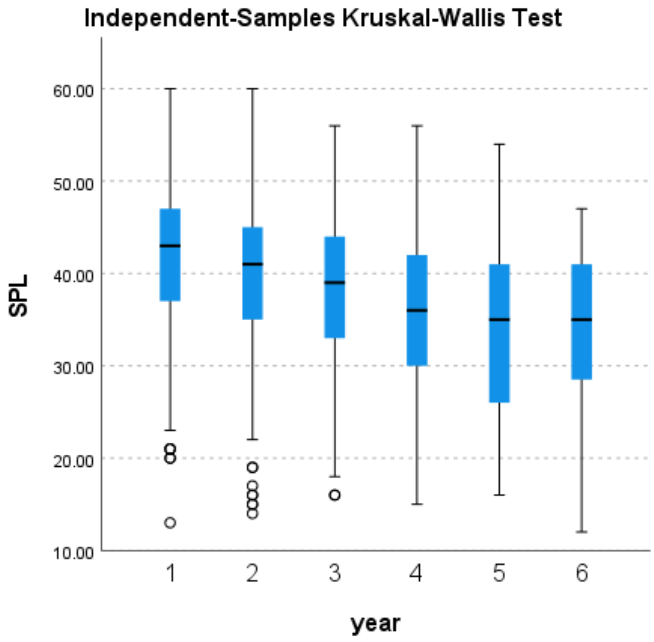


Figure 34. Comparison of years, SPL

Figure 35. displays that interquartile range for SPT is decreasing in later years. A significant difference was found between Year 1 and Year 2 ($p=0.001$), Year 1 and Year 3 ($p=0.037$), Year 1 and Year 5 ($p<0.001$) and Year 1 and Year 6 ($p<0.001$). There was a significant difference between Year 2 and Year 6 ($p<0.001$), Year 3 and Year 5 ($p=0.042$), Year 3 and Year 6 ($p<0.001$) and Year 4 and Year 6 ($p=0.029$).

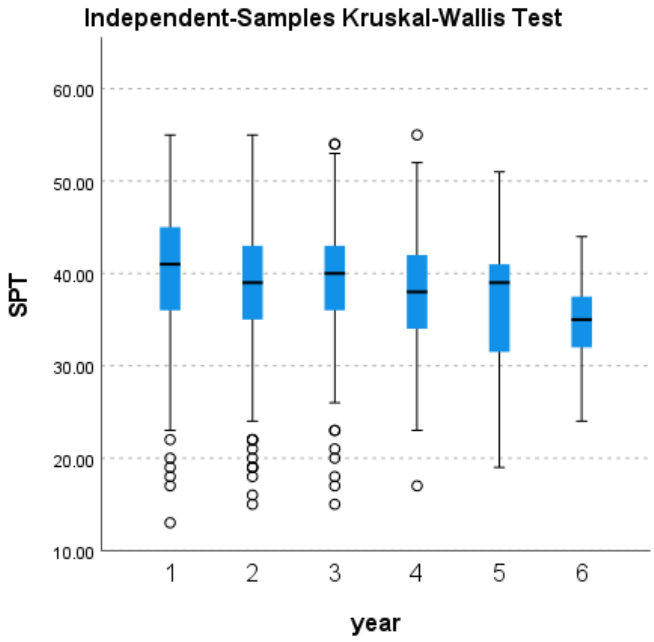


Figure 35. Comparison of years, SPT

Figure 36. shows that interquartile range for SASP varies with the different years, with the highest median value in Year 6. Significant difference was found between Year 6 and Year 4 (p=0.029), Year 6 and Year 3 (p<0.001), Year 6 and Year 2 (p<0.001), Year 6 and Year 1 (<.001) Year 5 and Year 3 (p=0.042) Year 5 and Year 1 (p<0.001) Year 3 and Year 1 (0=0.037) Year 2 and Year 1 (p=0.001).

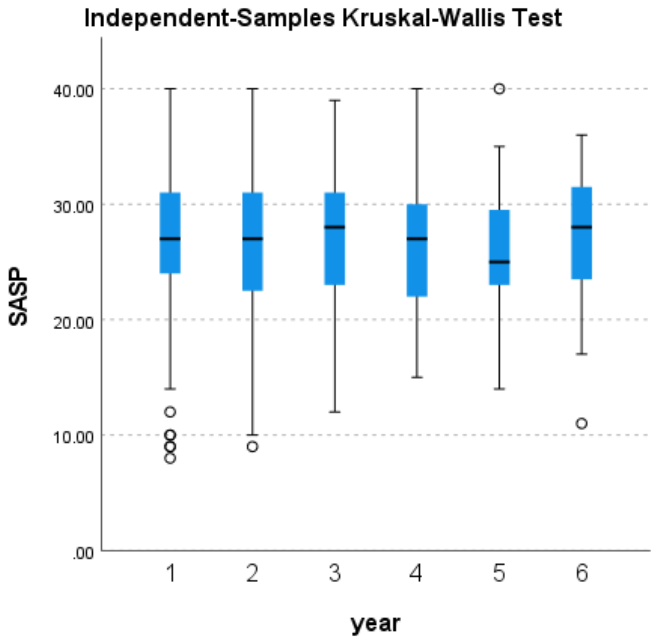


Figure 36. Comparison of years, SASP

Interquartile range for SPA is decreasing in the later years, shown in Figure 37. The lowest median value is observed in Year 5. Significant difference was found between Year 1 and all other years (Year 1 and Year 2 (0=0.015), Year 1 and Year 3 ($p<0.001$), Year 1 and Year 4 ($p<0.001$), Year 1 and Year 5 ($p<0.001$), Year 1 and Year 6 ($p=0.001$). Other significant differences were found between Year 2 and Year 4 ($p=0.017$), Year 2 and Year 5 ($p=0.007$) and Year 2 and Year 6 ($p=0.015$).

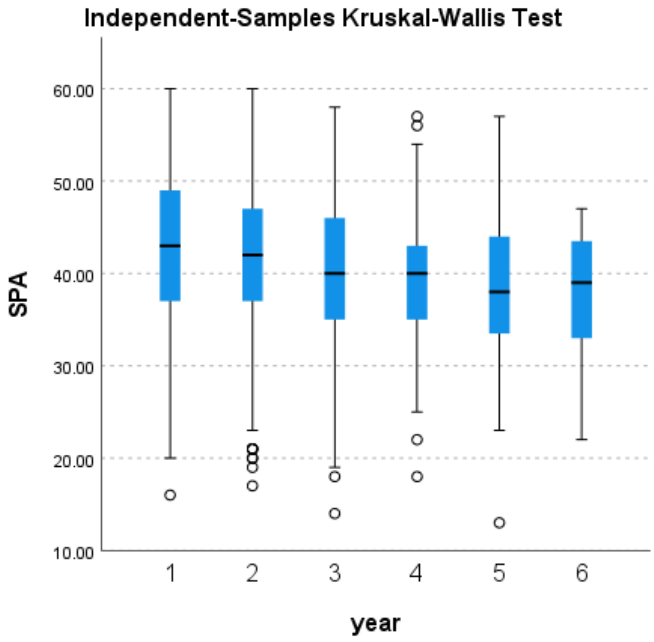


Figure 37. Comparison of years, SPA

In the case of SSSP, Figure 38. depicts a constant median value between the year groups. Quartile 1 is lowest in Year 3. Significant difference was found between Year 5 and Year 1 ($p<0.001$), Year 3 and Year 1 ($p=0.001$), Year 4 and Year 1 ($p=0.003$), Year 6 and Year 1 ($p=0.016$) Year 5 and Year 2 ($p=0.016$) Year 2 and Year 1 ($p=0.018$).

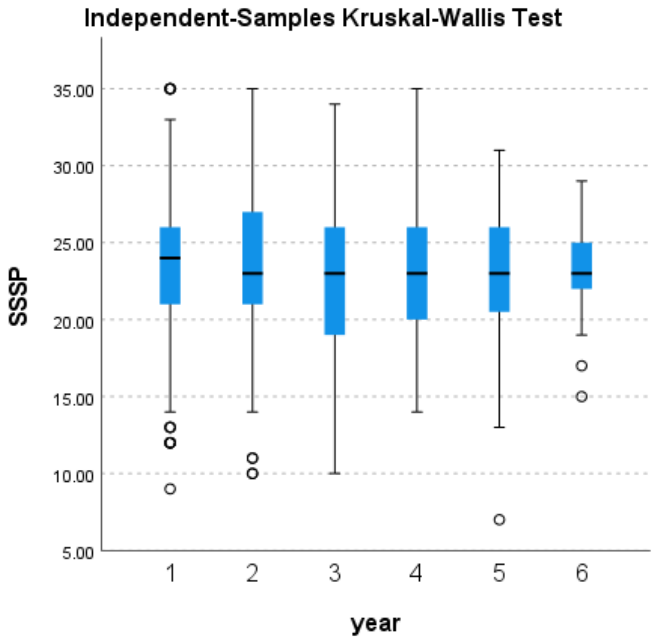


Figure 38. Comparison of years, SSSP

In consideration of further analysis, Spearman's rho, a nonparametric test was chosen to measure the association among the year groups. Positive numbers indicate a positive, while negative values indicate a negative correlation between the different items. Negative, significant correlation can be found between the years and SPL ($p<0.001$), SPT ($p<0.001$) and SPA ($p<0.001$), as shown in Table 24.

Confidence Intervals of Spearman's rho

	Spearman's rho	Significance(2-tailed)	95% Confidence Intervals (2-tailed)[a,b]	
			Lower	Upper
year - SPL	-.257	<.001	-.311	-.200
year - SPT	-.151	<.001	-.208	-.093
year - SASP	-.039	.183	-.098	.020
year - SPA	-.161	<.001	-.218	-.103
year - SSSP	-.044	.136	-.103	.016

a. Estimation is based on Fisher's r-to-z transformation.
b. Estimation of standard error is based on the formula proposed by Fieller, Hartley, and Pearson.

Table 24. Spearman Rank Correlation, year and DREEM subgroups

Lastly, the nonparametric Mann-Whitney U-test was carried out. Results of the first three academic years were compared to the last three years. Higher mean ranks signify better satisfaction with the given DREEM subgroup, and mean ranks of the Year 1-3 cohort are higher in all DREEM categories, displayed in Table 25. Mean rank for students' perceptions of learning (SPL) was 610.53 for Year 1-3, and 410.39 for the Year 4-6. The perception of teachers mean rank for students in Year 1-3 was 601.00, while the score in the Year 4-6 group was 468.92. Academic self-perception was also higher in the Year 1-3 cohort (586.85, against 555.81 in the Year 4-6 group). Perception of atmosphere was 600.85 in Year 1-3, and 469.79 in the Year 4-6 cohort, and social self-perception score was 584.36 in the former, and 571.07 in the latter student group.

Ranks

	years	N	Mean Rank	Sum of Ranks
SPLyear	1-3	1001	610.53	611137.00
	4-6	163	410.39	66893.00
	Total	1164		
SPTyear	1-3	1001	601.00	601596.50
	4-6	163	468.92	76433.50
	Total	1164		
SASPyear	1-3	1001	586.85	587432.50
	4-6	163	555.81	90597.50
	Total	1164		
SPAyear	1-3	1001	600.85	601455.00
	4-6	163	469.79	76575.00
	Total	1164		
SSSPyear	1-3	1001	584.36	584945.00
	4-6	163	571.07	93085.00
	Total	1164		

Table 25. Mann-Whitney U-test results for years in Year 1-3 and Year 4-6, by DREEM categories

Test Statistics[a]

	SPLyear	SPTyear	SASPyear	SPAyear	SSSPyear
Mann-Whitney U	53527.000	63067.500	77231.500	63209.000	79719.000
Wilcoxon W	66893.000	76433.500	90597.500	76575.000	93085.000
Z	-7.054	-4.657	-1.094	-4.620	-.469
Asymp. Sig. (2-tailed)	<.001	<.001	.274	<.001	.639

a. Grouping Variable: years

Table 26. Mann-Whitney U-test results for years in Year 1-3 and Year 4-6, by DREEM categories

Mann-Whitney U-test statistics are exhibited in Table 26. for each DREEM subgroup. Significance level was $p<0.05$. Significant differences were found between the Year 1-3 and Year 4-6 student cohorts in three DREEM subcategories (SPL, SPT and SSSP, $p<0.001$ in all cases).

As has been demonstrated, *H5 must be rejected, since the perception of international and Hungarian medical and dentistry students regarding their LE decreases as they progress with their studies, perceptions of students in their first three academic years are higher than their peers' in the last three years* throughout Hungary.

4. Discussion

The objective of this dissertation is to assess and evaluate international and Hungarian medical and dentistry students' perceptions regarding LE at the four medical schools throughout Hungary, to identify the strengths and potential areas of development of the Hungarian medical education and to reveal any differences in attitude compared with the domestic, Hungarian medical and dentistry student population. In the pursuit of this objective, this research was aimed to collect the perceptions of international and Hungarian medical and dentistry students on the LE at the four Hungarian medical schools, therefore, the results can be viewed as a compilation of the overall satisfaction of international and Hungarian students of the medical education throughout Hungary. The intent was to carry out a holistic investigation on students' opinion regarding their education environment, which includes all aspects of their studies, from the actual physical surroundings to the teaching methods including their own perceived professional knowledge.

Globalisation ushered in a certain interconnectedness to society, which also affected the field of education. As opportunities arose, students began seeking out higher education institutes in countries other than their own. Soon, students became aware of the possible advantages of studying abroad [87] and the differences between HEIs around the world, which led to an increasing demand to high quality services and competition between the institutes [17], [88]. HEIs put great effort in increasing their international recognition and reputation, with the purpose to increase their international student population. Thus, intercultural skills and competences are becoming increasingly important for educators [27], in order to successfully cooperate with students to achieve the shared educational objectives [26]. Students are influenced by a multitude of factors prior to choosing a HEI in another country. These factors include fees, student life at the HEI, its international recognition and the city or town where the HEI is located, moreover the wish to get acquainted with other cultures and to practice languages, mostly English. Another factor of utmost importance is the recognition and acceptance of the degree, awarded by the particular HEI, in other countries. [34].

HEIs in Hungary offer numerous programmes for international students, thus further advancing student mobility [89]. Oftentimes, the language of these programmes is English [50]. A continuous increase in the number of international students can be observed throughout

Hungary, especially at the four medical schools, which seemly rank as the most favoured choices among international students [37], [51]. Medical education is quite expensive, thus an increasing trend can be observed in measuring the effectiveness and quality of medical schools [52].

Students arrive to their chosen HEI with certain expectations [61], based on their previous learning experiences, which can be quite different from the Hungarian educational system. One crucial factor that could affect students' achievement, success and satisfaction is the learning environment [55]. The purpose of this research was to shed light on the perceptions of international medical and dentistry students regarding their LE, compared with the perceptions of their Hungarian peers', at the four medical schools throughout Hungary. In consideration of the evaluation regarding the LE, the internationally recognised and validated DREEM questionnaire was utilised, which was deemed as one of the most suitable instruments for measuring the learning environment in medical education [70]. Internal consistency for the overall questionnaire was high (Cronbach's α=0.92), subscale scores exhibited acceptable values (scores ranged from 0.65 to 8.87). The lowest score was observed in the social self-perception category. Total and subscale scores corresponded to other surveys conducted with the DREEM questionnaire [66], [90], [91], [92]. Total score (120.0) is interpreted, according to the DREEM guidelines, as "more positive than negative" [67], which beseems 79 out of 98 studies analysed in a systematic review [70].

The first two hypotheses were concerned with the perceptions among international and Hungarian students regarding their LE. International students' perceptions were compared with the Hungarian students', with the intention of determining if the former group deemed the LE worse than the latter. Next, perceptions of students in the English programme were compared with their peers in the German programme.

Following the evaluation of the DREEM questionnaire, it can be declared that the perceptions of international students are lower than their Hungarian peers. Total DREEM score in the international program was lower than in the Hungarian programme. One likely supporting reason why scores were higher for domestic Hungarian students implies they were more used to the workings and conditions of the Hungarian educational system than their international peers. These scores corresponded to the typical, mid-range DREEM score (120) reported at HEIs associated with traditional curricula. The highest score was observed in Australia (153.3)

and the lowest was in Canada (78.0) [93]. Denz-Penhey and Murdoch recommends immediate interventions in schools with DREEM scores lower than 140 [94]. Interestingly, the perceptions among the German student cohort were significantly lower than their peers' in the English programme, in which total DREEM scores were 118.1 and 110.8 in the two programmes, respectively. It is worth mentioning, that scores in the English and in the Hungarian programme did not differ considerably in three DREEM categories (perception of learning, academic and social self-perceptions).

Previous studies conducted at UPMS discovered that international and Hungarian students displayed similar thoughts and views regarding teaching and learning processes [95], [96], [97], [98]. Nevertheless, in the current DREEM results, the choices of students in the English and German programmes were noticeably lower in some cases, notably regarding the perception of teachers.

Students agreed that their teachers were knowledgeable, which corresponds to the findings of Varga [97]. However, participants were not satisfied with the amount of feedback received from teachers. Kossioni et al. and Edgren et al. reported similar findings, in which the lack of constructive feedback led to negative evaluation regarding LE [92], [99]. German students, in particular, indicated that they would benefit from more feedback and constructive criticism. Teachers were also considered authoritarian, who were irritated by the students and thus frequently became angry during classes. Dunne et al. observed results akin to these findings, surmising it as a possible attestation to the attitudes among senior teachers [100]. Ryan and Deci emphasise that a facilitator teacher could greatly impact students' intrinsic motivation in a positive way, enhancing their sense of independence and competence [60]. Student motivation can heavily depend on the effectiveness of LE established by the HEI [101]. Bassaw et al. propose the implementation of a student-centred curriculum and emphasises that a cooperative atmosphere among staff and students and students in general, should be fostered [102].

Other minor differences between the responses of the international and Hungarian participants were found in the students' perceptions of atmosphere, which was deemed too stressful. According to both international and Hungarian students, the amount of factual learning was too much, and they were unsure if they could memorise everything required. Similar outcomes were yielded by several other DREEM surveys [92], [99], [100]. German students were especially dissatisfied with the amount of factual learning at medical schools. Participants

expressed that they felt tired during classes, which were not too invigorating most of the time. They also found the support system for stressed students at their HEIs severely lacking. Comparable results were found in many articles, in which students often expressed a dissatisfaction with the support system [93], [99], [103], [104]. Zawawi and Elzubeir point out that medical students are more vulnerable to stress, anxiety and depression and oftentimes require assistance in confronting them [104]. Edgren et al. add that, due to the fact these scores tend to be low in all published DREEM results, the issue seems to be a common problem synonymous in medical education [99]. German students seemingly are more severely affected, based on the quantitative results. Stress, as a major factor impacting students' perceptions regarding LE negatively, was also mentioned in the open-ended questions. Results of the qualitative, semi-structured interviews entirely support this finding, interviewees frequently mentioned the hindering effect of stress on the achievement of students.

Issues with the timetable were highlighted in the open-ended questions, in particular among German students. Participants deemed their timetables brimming with classes with little room for preparation, practice or relaxation. Dunne et al. encountered similar results, in which timetabling was one of the points of concern [100]. The increasing difference between the student and staff proportions was highlighted during the semi-structured interviews. Participants mentioned that, while the number of international students was steadily rising, it was not compensated by the increase in the number of educators. Clinical doctors made notice of the difficulties of managing ward duties and practices simultaneously.

Lack of communities and options for socialisation were mentioned in the open-ended questions. Loneliness and social isolation were markedly common among the German student cohort. Students noted problems with the lack of spaces they could use for studying or socialising. These issues were underlined during the semi-structured interviews, furthermore, participants were often dissatisfied with the condition and size of classrooms, deeming them too small for large student groups. Shortened library hours were also mentioned by the students. Henning et al. encountered similar problems, in which several solutions were proposed, such as expanded opening hours at libraries [105].

Problems with communication and the language barrier was brought up during both the quantitative and the qualitative survey. This finding corresponds to Lannert and Derényi's

research, who pointed out the language barrier as a factor potentially hindering internationalisation [47]. Faubl draws similar conclusions [106].

In consideration of hypothesis 3, stating a correlation between lower academic and social self-perceptions and lower perceptions of learning, teaching and atmosphere, was found to be justified. These findings correspond to the results published by Edgren et al., who stated that academically less successful students seemingly have lower perceptions regarding their LE [99]. Chan et al. also noticed a correlation between better past academic achievements, quality of life and mindset, and higher DREEM scores [70]. However, significant differences were found between students in the English, German and Hungarian programmes in this regard, contradicting hypothesis 4. Students in the English programme, with lower academic and social self-perceptions, demonstrated considerably lower perceptions of teachers and atmosphere.

Lastly, hypothesis 5 claimed that the perception of medical and dentistry students regarding their LE is higher during their last three years throughout Hungary. This has proven to be inaccurate, since students in their first three years exhibited higher DREEM scores than in the remaining years. Rotthoff et al. reported similar findings, students' perceptions regarding their LE which deteriorated as their years progressed at the university. This was partially explained by the characteristics of the LE, and by the students' increasing criticism due to being older and more experienced [90]. Some interesting findings were found in the reviewed literature, Patil and Chaudhari reported the highest DREEM results in year 3 [59], and Farooq et al. found no correlation between students' year of study and perceptions regarding their LE [64]. Most often, however, decreasing DREEM scores were proclaimed in correlation with the progression of the academic years [69], [70], [93], [107], [108], [109], [110]. Statistically significant differences were found between all the subcategories of the DREEM inventory among the year groups, and the negative correlation thoroughly supported the findings.

5. Conclusions

The world has witnessed tremendous changes following the turn of the 20th century. Globalisation led to a transfer of goods and services around the globe, which inevitably resulted in the conveyance of knowledge. Students in HE began to look for universities offering better, more accessible education, which would provide a greater competitiveness once immersed in the job market. Thus, universities became, to quote Jimmy Carter once again, a "beautiful mosaic of different people" [31] coming from various cultural and religious backgrounds and having different perceptions about teaching and learning, based on their previous experiences. This, however, has posed a great challenge for educators, as culturally diverse groups require different approaches when compared with domestic, native classes.

The purpose of this dissertation is to assess and evaluate international medical and dentistry students' perceptions regarding the LE at the four medical schools throughout Hungary, to identify the strengths and potential areas of development of the Hungarian medical education and to reveal any differences in attitude compared with the domestic, Hungarian medical and dentistry student population. Student cohorts in the English, German and Hungarian programmes were analysed both together and separately, which yielded interesting results.

As it was hypothesised, international students are less content with the LE than their Hungarian peers. This phenomenon can be explained by the fact that Hungarian students familiarise themselves with the workings and conditions of the educational system in Hungary during their primary and secondary education. Tertiary education, therefore, poses no or little surprise for them, contrary to the international students, whose educational systems oftentimes differ from the Hungarian one. It was interesting, however, to note how students studying in the German programme had significantly lower perceptions on their LE than their peers in the English programme.

International and Hungarian students with low academic and social self-perceptions also had low perceptions in areas of learning, teachers and atmosphere, a good support system, therefore, could prove most effective in helping such students in need. Although the results in the English programme were noticeably lower regarding perceptions of teachers and atmosphere, students in all three programmes could benefit from such aid. It is important to mention, however, that

each medical school offers psychological consultations for students in need, and the Hungarian and the international student councils work tirelessly to ensure the welfare of medical and dentistry students.

Participants in their first three academic years exhibited higher perceptions than their peers in the last three years, which suggests a need for continuous surveillance of student well-being throughout their entire training at the medical schools.

At each medical school throughout Hungary, various steps have already been taken to ensure the highest quality education. Semmelweis University initiated a yearly assessment of the LE with the DREEM questionnaire in 2019, with the purpose to improve quality of education [111]. The University of Szeged made steps to improve and enhance digitalisation [112]. UPMS initiated the PotePillars project to improve the learning culture and physical environment aligned with several other strategic goals [113]. An important part of the former was to launch modern teaching methods and workshops for educators [114]. Skills labs were set up with the participation of Debrecen, Pécs and Szeged, which are simulation skill-centres where students can practice with the latest tools and equipment [115]. Students at UPMS can seek the aid of the psychology counselling service [116].

However, there are still areas in need of improvement, which should be remedied to further enhance the learning environment, thus decreasing attrition, and making the four medical schools in Hungary increasingly attractive for international students. These include large spaces for studying, longer library hours and effective and continuously available support system for students. Further language training opportunities could also prove beneficial for both students and staff.

In conclusion, the four medical schools throughout Hungary are the most popular destinations of internationally mobile students, and with the aid of continuous assessment of their perceptions and needs and consequent improvements on the learning environments, an even greater and favourable international recognition can be achieved.

6. Limitations

There are several limitations regarding this study, which deserve recognition. First and foremost, this cross-sectional research was limited in time. A longitudinal approach promises increased benefits.

Each student cohort responded to the questionnaire in English, and, while generally medical and dentistry students have a good command of English, providing German and Hungarian translations of the questionnaire may yield different results. The culturally independent nature of the DREEM questionnaire is not indisputable, some students may have interpreted the questions differently due to their cultural background.

The questionnaire did not provide any liberty for students to include their personal thoughts. This deficiency was partially remedied by adding open-ended questions at the end of the questionnaire, yet the issue regarding the rigidity of the original DREEM questionnaire remains unresolved. A thorough revision of the DREEM inventory is recommended [57].

Although the study involved all four medical schools throughout Hungary, participation was not equal in which some universities were more represented in the results than others. It also needs to be mentioned that, although the curriculum differs slightly at each medical school, they rely on a shared framework. Distribution of the students across the years was also uneven, the first three years were overrepresented (1001 participants were studying in the first three, and only 163 in the last three years).

In conclusion, further, longitudinal studies, both qualitative and quantitative, should be conducted to gain a more in-depth and wider understanding of international students' perceptions on the learning environment at the four medical schools, in order to provide them with higher quality learning experiences in Hungary.

7. Further implications

This research has led to interesting results about the perceptions of international and Hungarian medical and dentistry students in Hungary. Continuous assessment of the learning environment is essential at the medical schools for identifying areas with room for improvement and enhancing them in the best possible ways, therefore similar surveys should be conducted in the future.

In this cross-sectional study, however, only answers from one time period were collected and analysed. A longitudinal research project, akin to this study, can prove beneficial for better understanding of the learning environment. Contrasting multiple results acquired at different times may also yield interesting outcomes.

More focus groups interviews, involving clinical doctors, educators, administrators and students, could also provide valuable insight into the learning environment.

Updating and modernising the DREEM questionnaire might bestow more accurate and comprehensive insight into the perceptions of students of the 21st century, and open new perspectives in cross-cultural comparisons. Incorporating elements of modern teaching methods and learning practices could enhance the relevance and applicability of the DREEM inventory, and aid researchers in achieving a better understanding of students' needs and expectations.

As stated during the qualitative phase of the study, closer collaboration between the four medical schools would be fruitful and could be immensely advantageous for the improvement and international recognition of medical education throughout Hungary.

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List of publications

Articles related to the thesis

Dávidovics, A., Németh, T. (2021). International Students and Languages for Specific Purposed: The results of a study on international students' perceptions of teaching and learning LSP. *Journal of Languages for Specific Purposes*, *8*, 25-34.

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Additional articles

Dávidovics, A. (2023). Online oktatás és vizsgák a világjárvány alatt a pécsi orvostanhallgatók szemszögéből. *Porta Lingua* (preprint)

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Conference presentations

Dávidovics, A., Nagy, R., Németh, T. (2021, November). Perspectives of Medical Students on Online Education and Exams during COVID-19. Oral presentation at the XXI. SZOKOE Nemzetközi Szaknyelvi Online Konferencia - Fenntartható digitalizáció? – Nyereségek és veszteségek, szaknyelvoktatás és -kutatás változó környezetben, online.

Dávidovics, A. (2021, June). International medical students and online education during COVID-19. Oral presentation at the INCOLLAB Interdisciplinary Learning and Teaching Conference, online.

Dávidovics, A. (2020, November). Similarities and Differences in the Learning Styles of International and Hungarian Medical Students Studying Languages for Specific Purposes. Oral presentation at the XX. SZOKOE Nemzetközi Szaknyelvi Online Konferencia: Digitalizáció újratöltve: Szaknyelvoktatás és -kutatás változó környezetben, online.

Dávidovics, A., Németh, T. (2020, October). How do they like to learn? A comparative survey between international and Hungarian medical students studying languages for medical purposes. Oral presentation at the 2nd International Conference of the Slovene Association of LSP Teachers, online.

Dávidovics, A., Németh, T. (2020, October). Teaching and Learning Medical Hungarian vs. Medical English: Similarities and Differences. Oral presentation at the EALTHY 1st International Symposium: Communication in Healthcare: Language Training and Clinical Interaction, online.

Dávidovics, A., Németh, T. (2020, September). Teaching International and Hungarian Gen Z Medical Students: Which Path Should Teachers Take at the Crossroads? Poster presentation at the XVI CercleS international conference: Language Centres at a Crossroads: Open Directions for New Generations of Learners, online.

Dávidovics, A., Németh, T. (2019, December). Multicultural Learning Styles of iGen International Medical Students. Poster presentation at the Multilingual and Multicultural Learning: Policies and Practices, Prague, Czech Republic.

Dávidovics, A., Németh, T. (2019, November). Teaching Medical Hungarian to International Students: Their Needs and Requirements. Poster presentation at the XIX. SZOKOE Szaknyelvi Konferencia, Budapest, Hungary.

Dávidovics, A., Németh, T. (2019, October). Intercultural Challenges of Teaching Medical Hungarian in a Multicultural Classroom. Poster presentation at the 4th International English for Healthcare Conference, Castellon, Spain.

Appendix

Table 27. Nationalities, native and other spoken languages of the participants (N=1164)

Nationalities		Native languages		Other spoken languages
Albanian	1	Albanian	2	Albanian, Arabic, Azeri, Basque, Bengali, Catalan, Chechen, Chinese, Creole, Croatian, Danish, Dutch, English, French, Georgian, German, Gujarati, Hebrew, Hindi, Hungarian, Igbo, Italian, Japanese, Kikuyu, Korean, Kurdish, Luganda, Malayalam, Norwegian, Pashto, Persian, Polish, Portuguese, Punjabi, Romanian, Russian, Sinhala, Slovak, Somali, Spanish, Swahili, Swedish, Tagalog, Taiwanese, Tamil, Turkish, Ukrainian, Urdu, Vietnamese, Yoruba None (N=5)
American	8	Arabic	72	
Angolan	5	Arabic, English	6	
Armenian-Jordanian	1	Arabic, German	2	
Australian	1	Arabic, Hebrew	1	
Austrian	2	Arabic, Norwegian	4	
Bangladeshi	4	Arabic, Persian	1	
Belgian	1	Armenian	1	
Brazil	1	Bengali	4	
British	5	Chechen	1	
British-Irish	1	Chinese	28	
Canadian	12	Chinese, English	2	
Chechen	1	Chinese, Japanese	1	
Chinese	27	Chinese, Norwegian	1	
Croatian	1	Chinese, Uyghur	1	
Cuban	1	Croatian	2	
Cypriot	1	Dutch	2	
Dubai	1	English	49	
Dutch	1	English, Bengali, Hindi	1	
Egyptian	7	English, German	5	
Emirati	3	English, Hebrew	1	
French	1	English, Hindi	1	
German	134	English, Hungarian	4	
German-Hungarian	1	English, Japanese	1	
Ghanaian	1	English, Korean	2	
Greek	1	English, Norwegian	6	
Hungarian	498	English, Persian, Turkish	1	
Hungarian-Japanese	1	English, Vietnamese	1	
Hungarian-Polish	1	French	2	
Indian	17	French, Kinyarwanda	1	
Iranian	65	German	128	
Iraqi	3	German, French	1	
Israeli	11	German, Hungarian	5	
Israeli-Portuguese	1	German, Serbian	1	
Italian	1	Greek	1	
Japanese	37	Hebrew	4	
Jordanian	30	Hebrew, English, Portuguese	1	
Kazakh	1	Hindi	10	
Kenyan	4	Hungarian	486	
Kosovar	1	Hungarian, Italian	1	
Kurdish	2	Hungarian, Japanese	1	
Lebanese	2	Hungarian, Polish	1	
Mauritian	1	Hungarian, Portuguese	1	
Moroccan	3	Hungarian, Turkish	1	
Nigerian	17	Igbo	2	
Norwegian	155	Isixhosa	1	
Pakistani	6	Italian	1	
Palestinian	9	Japanese	35	

Portuguese	2	Kazakh	1
Romanian	1	Kisii	1
Rwandan	1	Korean	14
Saudi Arabian	2	Kurdish	4
Serbian	1	Malayalam	1
Singaporean	1	Norwegian	124
South African	2	Norwegian, Persian	2
South Korean	15	Norwegian, Persian, Azeri	1
Spanish	4	Norwegian, Persian, Spanish	1
Sri Lankan	3	Norwegian, Portuguese	1
Swedish	4	Norwegian, Swedish	1
Syrian	8	Norwegian, Vietnamese	1
Taiwanese	6	Persian	60
Turkish	13	Persian, Azerbaijani	1
Ugandan	1	Portuguese	9
Ukrainian	1	Punjabi	3
Vietnamese	7	Romanian	1
Yemeni	1	Shona	2
Zimbabwean	1	Sinhala	2
		Somali	1
		Spanish	4
		Spanish, Catalan	1
		Swahili	1
		Swedish	2
		Telugu	1
		Thai	1
		Turkish	14
		Ukrainian, Russian	1
		Urdu	12
		Uyghur	1
		Vietnamese	8

Table 28. DREEM scores (mean, standard deviation, median, q1 and q3) for each language programme

	Language Programmes (N=1164)	**International Students (N=663)**	**English Programme (N=545)**	**German Programme (N=118)**	**Hungarian Programme (N=501)**
Subscale	Item total=50	Mean SD Median (q1; q3)	Mean SD Median (q1; q3)	Mean SD Median (q1; q3)	Mean SD Median (q1; q3)
Students' Perceptions of Learning	1. I am encouraged to participate in classes.	2.8 1.0 3 (2; 4)	2.9 1.0 3 (2; 4)	2.6 1.0 3 (2; 3)	2.8 1.0 3 (2; 4)
	7. The teaching is often stimulating.	2.3 1.1 2 (2; 3)	2.3 1.1 2 (2; 3)	2.0 1.0 2 (1; 2.75)	2.3 1.0 2 (2; 3)
	13. The teaching is student centred.	2.2 1.2 2 (1; 3)	2.2 1.2 2 (1; 3)	2.0 1.2 2 (1; 3)	2.1 1.2 2 (1; 3)
	16. The teaching is sufficiently concerned to develop my competence.	2.5 1.1 3 (2; 3)	2.5 1.1 3 (2; 3)	2.4 1.0 3 (2; 3)	2.6 1.0 3 (2; 3)
	20. The teaching is well focused.	2.5 1.1 3 (2; 3)	2.6 1.1 3 (2; 3)	2.2 1.0 2 (2; 3)	2.5 1.0 3 (2; 3)
	22. The teaching is sufficiently concerned to develop my confidence.	2.1 1.2 2 (1; 3)	2.2 1.2 2 (1; 3)	1.8 1.0 2 (1; 2)	1.9 1.2 2 (1; 3)
	24. The teaching time is put to good use.	2.4 1.1 2 (2; 3)	2.4 1.1 2 (2; 3)	2.1 1.0 2 (2; 3)	2.4 1.1 3 (2; 3)
	25. The teaching over-emphasises factual learning.	1.6 0.9 2 (1; 2)	1.6 0.9 2 (1; 2)	1.7 0.9 2 (1; 2)	1.4 1.0 2 (1; 2)
	38. I am clear about the learning objectives of the courses.	2.5 1.1 3 (2; 3)	2.5 1.1 3 (2; 3)	2.3 1.0 2 (2; 3)	2.6 1.0 3 (2; 3)

	44. The teaching encourages me to be an active learner.	2.3 1.2 2 (1; 3)	2.4 1.2 2 (2; 3)	1.9 1.3 2 (1; 3)	2.3 1.2 2 (2; 3)
	47. Long term learning is emphasised over short term.	2.4 1.2 2 (2; 3)	2.5 1.2 3 (2; 3)	1.7 1.2 2 (1; 3)	2.6 1.2 3 (2; 3)
	48. *The teaching is too teacher-centred.*	2.0 1.1 2 (1; 3)	2.0 1.1 2 (1; 3)	2.1 1.0 2 (1.25; 3)	2.1 1.1 2 (1; 3)
Students' Perceptions of Teachers	2. The teachers are knowledgeable.	3.2 0.9 3 (3; 4)	3.3 0.8 3 (3; 4)	3.0 0.9 3 (3; 4)	3.4 0.7 3 (3; 4)
	6. The teachers are patient with patients.	2.6 1.0 3 (2; 3)	2.6 1.0 3 (2; 3)	2.7 1.0 3 (2; 3)	2.7 1.0 3 (2; 3)
	8. The teachers ridicule the students.	2.3 1.2 2 (2; 3)	2.3 1.3 2 (1; 3)	2.5 1.0 2 (2; 3)	2.5 1.1 3 (2; 3)
	9. The teachers are authoritarian.	1.6 1.2 2 (1; 2)	1.6 1.2 2 (1; 2)	1.4 1.1 1 (1; 2)	1.7 1.0 2 (1; 2)
	18. The teachers have good communications skills with patients.	2.6 1.0 3 (2; 3)	2.6 1.0 3 (2; 3)	2.5 0.9 2 (2; 3)	2.8 0.9 3 (2; 3)
	29. The teachers are good at providing feedback to students.	2.1 1.2 2 (1; 3)	2.1 1.2 2 (1; 3)	1.8 1.0 2 (1; 3)	2.2 1.1 2 (1; 3)
	32. The teachers provide constructive criticism here.	2.1 1.1 2 (1; 3)	2.2 1.1 2 (2; 3)	1.8 1.1 2 (1; 3)	2.2 1.0 2 (2; 3)
	37. The teachers give clear examples.	2.5 1.1 3 (2; 3)	2.6 1.0 3 (2; 3)	2.2 1.0 2 (2; 3)	2.7 1.0 3 (2; 3)
	39. The teachers get angry in class.	2.7 1.2 3 (2; 4)	2.6 1.2 3 (2; 4)	3.0 1.1 3 (3; 4)	3.2 1.0 3 (3; 4)

	40. The teachers are well prepared for their classes.	3.0 1.0 3 (2; 4)	3.0 1.0 3 (2; 4)	2.9 0.9 3 (3; 3)	3.1 0.9 3 (3; 4)
	50. *The students irritate the teachers.*	2.4 1.2 2 (2; 3)	2.4 1.2 2 (2; 3)	2.5 1.1 2.5 (2; 3)	2.8 1.1 3 (2; 4)
Students' Academic self-Perceptions	5. Learning strategies which worked for me before continue to work for me now.	2.3 1.1 2 (2; 3)	2.3 1.1 2 (2; 3)	2.2 1.1 2 (2; 3)	2.4 1.1 2 (2; 3)
	10. I am confident about my passing this year.	2.4 1.3 3 (2; 3)	2.4 1.3 3 (2; 3)	2.3 1.2 2 (1; 3)	2.5 1.2 3 (2; 3)
	21. I feel I am being well prepared for my profession.	2.6 1.1 3 (2; 3)	2.6 1.2 3 (2; 3)	2.4 1.0 3 (2; 3)	2.4 1.2 3 (2; 3)
	26. Last year's work has been a good preparation for this year's work.	2.4 1.2 2 (2; 3)	2.4 1.2 3 (2; 3)	2.3 1.1 2 (2; 3)	2.4 1.1 3 (2; 3)
	27. I am able to memorise all I need.	1.8 1.2 2 (1; 3)	1.9 1.2 2 (1; 3)	1.6 1.1 1.5 (1; 2.75)	2.0 1.2 2 (1; 3)
	31. I have learned a lot about empathy in my profession.	2.3 1.2 2 (1; 3)	2.4 1.1 2 (2; 3)	1.7 1.2 2 (1; 2.75)	2.6 1.1 3 (2; 3)
	41. My problem solving skills are being well developed here.	2.4 1.1 2 (2; 3)	2.4 1.1 3 (2; 3)	2.1 0.9 2 (2; 3)	2.5 1.1 3 (2; 3)
	45. Much of what I have to learn seems relevant to a career in medicine.	2.5 1.2 3 (2; 3)	2.7 1.1 3 (2; 4)	1.8 1.3 2 (1; 3)	2.4 1.1 3 (2; 3)
Students' Perceptions of Atmosphere	11. The atmosphere is relaxed during the ward teaching.	2.4 1.0 2 (2; 3)	2.4 1.1 2 (2; 3)	2.3 1.0 2 (2; 3)	2.5 1.0 2 (2; 3)
	12. This school is well timetabled.	2.1 1.3 2 (1; 3)	2.1 1.3 2 (1; 3)	1.8 1.2 2 (1; 3)	2.0 1.2 2 (1; 3)

	17. Cheating is a problem in this school.	2.5 1.4 3 (2; 4)	2.5 1.4 3 (2; 4)	2.5 1.3 3 (2; 4)	2.8 1.2 3 (2; 4)
	23. The atmosphere is relaxed during lectures.	2.5 1.1 3 (2; 3)	2.6 1.1 3 (2; 3)	2.4 1.1 3 (2; 3)	2.7 1.0 3 (2; 3)
	30. There are opportunities for me to develop interpersonal skills.	2.2 1.1 2 (1; 3)	2.3 1.2 2 (2; 3)	1.9 1.1 2 (1; 3)	2.5 1.1 3 (2; 3)
	33. I feel comfortable in classes socially.	2.8 1.1 3 (2; 4)	2.8 1.0 3 (2; 4)	2.8 1.1 3 (2; 4)	2.8 1.1 3 (2; 4)
	34. The atmosphere is relaxed during seminars/tutorials.	2.7 1.1 3 (2; 4)	2.7 1.1 3 (2; 4)	2.8 1.1 3 (2; 4)	3.0 1.0 3 (3; 4)
	35. I find the learning experience disappointing.	2.3 1.2 2 (2; 3)	2.3 1.2 2 (2; 3)	2.3 1.2 2 (1.25; 3)	2.4 1.2 3 (2; 3)
	36. I am able to concentrate well.	2.4 1.1 2 (2; 3)	2.4 1.0 2 (2; 3)	2.3 1.1 2 (2; 3)	2.2 1.1 2 (2; 3)
	42. The enjoyment outweighs the stress of studying medicine.	1.8 1.3 2 (1; 3)	1.8 1.3 2 (1; 3)	1.8 1.3 2 (1; 3)	1.8 1.2 2 (1; 3)
	43. The atmosphere motivates me as a learner.	2.3 1.2 2 (1; 3)	2.3 1.2 2 (1; 3)	2.0 1.2 2 (1; 3)	2.5 1.2 3 (2; 3)
	49. I feel able to ask the questions I want.	2.7 1.2 3 (2; 4)	2.7 1.2 3 (2; 4)	2.9 1.2 3 (2; 4)	2.8 1.1 3 (2; 4)
Students' Social Self-Perceptions	3. There is a good support system for students who get stressed.	1.7 1.2 2 (1; 2)	1.7 1.2 2 (1; 3)	1.4 1.1 1 (1; 2)	1.8 1.3 2 (1; 3)
	4. I am too tired to enjoy the courses.	1.7 1.2 2 (1; 3)	1.8 1.2 2 (1; 3)	1.7 1.1 2 (1; 2)	1.6 1.1 2 (1; 2)

14. I am rarely bored on the courses.	1.8 1.2 2 (1; 3)	1.8 1.2 2 (1; 3)	1.6 1.0 2 (1; 2)	1.7 1.1 2 (1; 2)
15. I have good friends in this school.	3.2 1.0 4 (3; 4)	3.1 1.1 4 (3; 4)	3.3 1.0 4 (3; 4)	3.3 1.0 4 (3; 4)
19. My social life is good.	2.6 1.2 3 (2; 4)	2.7 1.2 3 (2; 4)	2.5 1.3 3 (2; 4)	2.7 1.2 3 (2; 4)
28. I seldom (rarely) feel lonely.	2.1 1.3 2 (1; 3)	2.1 1.3 2 (1; 3)	1.9 1.3 2 (1; 3)	2.2 1.3 2 (1; 3)
46. My accommodation is pleasant.	2.9 1.0 3 (2; 4)	3.0 1.0 3 (2; 4)	2.8 1.0 3 (2; 4)	3.1 1.0 3 (2; 4)

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DREEM questionnaire

The Dundee Ready Education Environment Measure

In this survey we would like to ask you to share your thoughts about the learning environment at the Medical School you study at. The purpose of this study is to assess and evaluate your responses with the aim to improve your learning conditions. The survey is completely anonymous, and it will take no more than 10 minutes of your time. Thank you very much!

This questionnaire is a part of my PhD research, if you have any questions, feel free to contact me via email (anna.davidovics@aok.pte.hu). Your help is much appreciated!

*Required

Biodata

1. What is your gender? *

Mark only one oval.

- ◯ I am a woman.
- ◯ I am a man.
- ◯ I prefer not to say.

2. How old are you? *

Mark only one oval.

- ◯ 20 or below
- ◯ 21-25
- ◯ 26-30
- ◯ 31 or above

3. What is your nationality? *

Mark only one oval.

- ◯ Chinese
- ◯ German
- ◯ Hungarian
- ◯ Iranian
- ◯ Japanese
- ◯ Jordanian
- ◯ Nigerian
- ◯ Norwegian
- ◯ South Korean
- ◯ Spanish
- ◯ Other: _____

4. What is your native language? *

Tick all that apply.

- ☐ Arabic
- ☐ Chinese
- ☐ English
- ☐ German
- ☐ Hungarian
- ☐ Japanese
- ☐ Norwegian
- ☐ Persian
- ☐ Korean
- ☐ Spanish
- Other: ☐ _____

5. Which additional languages can you speak? *

Tick all that apply.

- [ ] Arabic
- [ ] Chinese
- [ ] English
- [ ] German
- [ ] Hungarian
- [ ] Japanese
- [ ] Norwegian
- [ ] Persian
- [ ] Korean
- [ ] Spanish

Other: [ ] _____

6. Which Medical School do you attend? *

Mark only one oval.

- ◯ Semmelweis University
- ◯ University of Debren
- ◯ University of Pécs
- ◯ University of Szeged
- ◯ Other: _____

7. What do you study? *

Mark only one oval.

- ◯ General Medicine
- ◯ Dentistry
- ◯ Other: _____

8. In which language programme do you study?

Mark only one oval.

- ◯ English programme
- ◯ German programme
- ◯ Hungarian programme
- ◯ Other: _____

9. What year are you in? *

Mark only one oval.

- ◯ 1st year
- ◯ 2nd year
- ◯ 3rd year
- ◯ 4th year
- ◯ 5th year
- ◯ 6th year

Questionnaire

In this section we would like to know your view on your learning environment. Please think about the following statements IN GENERAL and indicate whether you: Strongly Disagree (1), Disagree (2), Unsure (3), Agree (4), or Strongly Agree (5) with them.

10. 1. I am encouraged to participate in class. *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

11. 2. The teachers are knowledgeable. *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

12. 3. There is a good support system for students who get stressed. *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

13. 4. I am too tired to enjoy the courses. *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

14. 5. Learning strategies which worked for me before continue to work for me now. *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

15. 6. The teachers are patient with patients. *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

16. 7. The teaching is often stimulating. *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

17. 8. The teachers ridicule the students. *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

18. 9. The teachers are authoritarian. *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

19. 10. I am confident about my passing this year. *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

20. 11. The atmosphere is relaxed during the ward teaching. *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

21. 12. This school is well timetabled. *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

22. 13. The teaching is student centred. *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

23. 14. I am rarely bored on the courses. *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

24. 15. I have good friends in this school. *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

25. 16. The teaching is sufficiently concerned to develop my competence. *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

26. 17. Cheating is a problem in this school. *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

27. 18. The teachers have good communications skills with patients. *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

28. 19. My social life is good. *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

29. 20. The teaching is well focused. *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

30. 21. I feel I am being well prepared for my profession. *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

31. 22. The teaching is sufficiently concerned to develop my confidence. *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

32. 23. The atmosphere is relaxed during lectures. *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

33. 24. The teaching time is put to good use. *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

34. 25. The teaching over-emphasises factual learning. *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

35. 26. Last year's work has been a good preparation for this year's work. *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

36. 27. I am able to memorise all I need. *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

37. 28. I seldom (rarely) feel lonely. *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

38. 29. The teachers are good at providing feedback to students. *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

39. 30. There are opportunities for me to develop interpersonal skills. *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

40. 31. I have learned a lot about empathy in my profession. *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

41. 32. The teachers provide constructive criticism here. *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

42. 33. I feel comfortable in classes socially. *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

43. 34. The atmosphere is relaxed during seminars/tutorials. *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

44. 35. I find the learning experience disappointing. *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

45. 36. I am able to concentrate well. *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

46. 37. The teachers give clear examples. *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

47. 38. I am clear about the learning objectives of the courses. *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

48. 39. The teachers get angry in class. *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

49. 40. The teachers are well prepared for their classes. *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

50. 41. My problem solving skills are being well developed here. *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

51. 42. The enjoyment outweighs the stress of studying medicine. *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

52. 43. The atmosphere motivates me as a learner. *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

53. 44. The teaching encourages me to be an active learner. *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

54. 45. Much of what I have to learn seems relevant to a career in medicine. *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

55. 46. My accommodation is pleasant. *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

56. 47. Long term learning is emphasised over short term. *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

57. 48. The teaching is too teacher-centred. *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

58. 49. I feel able to ask the questions I want. *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

59. 50. The students irritate the teachers. *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

Additional questions

60. Could you please list any other factors which you feel have an influence on the learning environment?

61. Do you have any positive experiences/stories to share about the learning environment?

62. Do you have any less positive experiences/stories to share about the learning environment?

63. Do you have any suggestions to improve your learning environment?

64. Do you have any other comments regarding the questionnaire?

Semi-structured interview questions

UNIVERSITY OF PÉCS
MEDICAL SCHOOL

Interview questions

1. What is your opinion on the learning environment?
2. What do you consider good/positive?
3. What specific strength of the learning environment would you highlight?
4. What problems do you face most often?
5. What needs to be improved in your opinion?
6. Do you like/would you like to study here? Why/why not?
7. Do you think education is student-friendly in your institute?
8. What is your opinion about educators/doctors? Do they explain the material well? Are they knowledgeable?
9. Are the educators/doctors patient with patients?
10. What is your opinion about the students? Are they open-minded? Interested? Friendly? Are they stressed?

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studentservice.center@aok.pte.hu

Ethical approval

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Egészségügyi Tudományos Tanács
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Székhely: Budapest 1054 Alkotmány u. 25.

Ügyiratszám: **IV/2562- 3 /2022/EKU**
Ügyintéző neve: **Dr. Kardon Tamás titkár**
Elérhetősége: **tukeb@emmi.gov.hu**
Telefon: **+(36) 1 795-1197**

Tárgy: Engedélyező határozat

Kutatóhely neve: *Pécsi Tudományegyetem Egészségtudományi Doktori Iskola*
Kutatóhely címe:
Pécs
Vörösmarty M. u. 4.
7621

Kutatásvezető: Dr. Németh Tímea és Dávidovics Anna *részére*

HATÁROZAT

A(z) Pécsi Tudományegyetem Egészségtudományi Doktori Iskola, mint megbízó (7621 Pécs Vörösmarty M. u. 4.) képviseletében Dr. Németh Tímea és Dávidovics Anna (7621 Pécs Vörösmarty M. u. 4.) (továbbiakban: Kérelmezők) "A magyar és külföldi orvos-és fogorvostan hallgatók véleménye az oktatási környezetről a négy magyarországi orvostudományi egyetemen" című, beavatkozással nem járó vizsgálat engedélyezése iránt kérelmet nyújtottak be az Egészségügyi Tudományos Tanács Tudományos és Kutatásetikai Bizottságához (az ETT TUKEB-hez).

Az ETT TUKEB, mint **elsőfokú** hatóság, a vizsgálat engedélyezése iránti kérelmet megvizsgálta és a következő, testületi véleményen alapuló döntést hozta:

Az ETT TUKEB a benyújtott kérelem szerinti, beavatkozással nem járó vizsgálatra

a szakmai-etikai engedélyt megadja.

Az eljárás során eljárási költség nem merült fel tekintettel arra, hogy a kérelmezett vizsgálat nem kereskedelmi vizsgálat.

A Bizottság döntése ellen a közlést követő 15 napon belül van helye fellebbezésnek az ETT Elnökségéhez. A fellebbezést az ETT TUKEB-hez kell benyújtani.

A fellebbezési eljárás illeték- és díjmentes.

INDOKOLÁS

A Kérelmezők "A magyar és külföldi orvos-és fogorvostan hallgatók véleménye az oktatási környezetről a négy magyarországi orvostudományi egyetemen" című, beavatkozással nem járó vizsgálat engedélyezése iránt kérelmet nyújtottak be ETT TUKEB-hez, ami 2022. március 16-én érkezett meg a Bizottsághoz.

Az eljárás megindult és az ETT TUKEB az általános közigazgatási rendtartásról szóló 2016. évi CL. törvény (továbbiakban: *Ákr.*) 43.§ (1) bekezdésében foglalt intézkedéseket mellőzte, és tekintettel arra, hogy a teljes eljárás feltételei fennállnak, a Bizottság a kérelmet az *Ákr* 43 §-a alapján teljes eljárásban bírálta el. Az ETT TUKEB az *Ákr* 43 § (2) bekezdése alapján 2022. március ig erről és az *Ákr* 43 § (2) bekezdésében meghatározott egyéb tényekről tájékoztatta a Kérelmezőket.

Az eljárás során az ETT TUKEB megvizsgálta és megtárgyalta a kérelmet és a csatolt dokumentumokat.

Az ETT TUKEB az Ákr. 44. § alapján szükségesnek tartotta a hiánypótlást. A Bizottság 2022. április 7-i hiánypótlási felhívásában foglaltaknak a kérelmezők a megadott határidőn belül, 2022. április 8-én eleget tettek.

A tervezett, beavatkozással nem járó vizsgálat azonosító adatai:

A vizsgálat címe:
"A magyar és külföldi orvos-és fogorvostan hallgatók véleménye az oktatási környezetről a négy magyarországi orvostudományi egyetemen"

Kutatásvezetők, akik az egész vizsgálatot vezetik: Dr. Németh Tímea és Dávidovics Anna
Kutatásvezető munkahelye: Pécsi Tudományegyetem Egészségtudományi Doktori Iskola

Megbízó neve és címe:
Pécsi Tudományegyetem Egészségtudományi Doktori Iskola
7621 Pécs, Vörösmarty M. u. 4.

A vizsgálat tervezett időtartama: 2022.04.12 - 2023.06.30

A vizsgálatban részt vevő vizsgálóhelyek felsorolása, valamint az adott vizsgálóhelyen a vizsgálat vezetője:
Egycentrumos vizsgálat.

Az ETT TUKEB a kutatási engedély iránti kérelemről - a beérkezett hiánypótlást is figyelembe véve - *az emberen végzett orvostudományi kutatások, az emberi felhasználásra kerülő vizsgálati készítmények klinikai vizsgálata, valamint az emberen történő alkalmazásra szolgáló, klinikai vizsgálatra szánt orvostechnikai eszközök klinikai vizsgálata engedélyezési eljárásának szabályairól szóló 235/2009. (X. 20.) Korm. rendelet* (a továbbiakban: *235/2009. Korm. rendelet*) 18. § (2) bekezdése alapján a következőket állapította meg:

a) A beadott kérelem tárgyául szolgáló vizsgálat valóban beavatkozással nem járó vizsgálat-e?
Igen

b1) A tervezett vizsgálat érdemi, szakmai tudományos kérdésfelvetéseket tartalmaz-e?
Igen

b2) A tervezett vizsgálat módszerei alkalmasak-e az érdemi, szakmai tudományos kérdésfelvetések megválaszolására?
Igen

c1) A betegtájékoztató és a beleegyező nyilatkozat tervezett szövege megfelel-e az emberen végzett orvostudományi kutatásokról szóló miniszteri rendeletben foglaltaknak?
Igen

c2) A toborzás tervezett szövege megfelel-e az emberen végzett orvostudományi kutatásokról szóló miniszteri rendeletben foglaltaknak?
Igen

Mindezek alapján az ETT TUKEB a rendelkező résznek megfelelően határozott, és engedélyezte a kutatási engedély iránti kérelemben megjelölt beavatkozással nem járó vizsgálatot.

Felhívjuk a Kérelmezők figyelmét arra a jogszabályi kötelezettségére, mely szerint a beavatkozással nem járó vizsgálat befejezését követő kilencven napon belül értesíteniük kell az ETT TUKEB-et a vizsgálat befejezéséről, a bevont betegek számáról, illetve köréről, továbbá a vizsgálat befejezését követő

százhetvenolcvan napon belül értesíteniük kell az ETT TUKEB-et a vizsgálat célkitűzésére adott válaszról. (Ezt az előírást *az emberen végzett orvostudományi kutatásokról szóló 23/2002. (V. 9.) EüM rendelet* (továbbiakban: *23/2002. (V. 9.) EüM rendelet*) 20/O. § tartalmazza.)

Kérjük, amennyiben a beavatkozással nem járó vizsgálat nem kezdődik el, vagy idő előtt lezárásra kerül, akkor erről - az indokok felsorolásával - e-mailen és levélben is tájékoztassák az ETT TUKEB-et. (Ezt a *235/2009. Korm. rendelet* 21. § (3) bekezdése írja elő.)

Az ETT TUKEB eljárása és határozata elsősorban *az egészségügyről szóló 1997. évi CLIV. törvény* (továbbiakban: *Eütv.*) 164/A. § (1) és (2).bekezdésein, a *235/2009. (X. 20.) Korm. rendelet* 17/A. § (1) - (4), a 18. § (1) és (2) bekezdésein, valamint a az *Ákr.* 80. § (1) bekezdésén és az *Ákr.* 81. § (1) és (4) bekezdésein alapul.

A kutatásengedélyezési eljárásokban az *Eütv.* 164/B. § kimondja "Az orvostudományi kutatás, valamint a 164/A. § szerinti beavatkozással nem járó vizsgálat engedélyezési eljárásáért - az egészségügyért felelős miniszternek az adópolitikáért felelős miniszterrel egyetértésben kiadott rendeletében meghatározott - igazgatási szolgáltatási díjat kell fizetni."
A kérelemben foglaltak alapján az ETT TUKEB megállapította, hogy a tervezett kutatás nem kereskedelmi vizsgálat a *23/2002. EüM. rend.* 20/B. § f) pontja alapján, ezért a Kérelmezőknek eljárási költség, és így igazgatási szolgáltatási díjfizetési kötelezettsége sem keletkezett a *23/2002. EüM. rend.* 15. §-a és 20/R. § (1) bekezdése szerint.

A Bizottság hatásköre és illetékessége az *Eütv.* 164/A. § (2) bekezdésén, valamint *235/2009. Korm. rend.* 16. § a) pontján, a 17. § (1) bek. a) pontja ab) alpontján alapul.

A fellebbezés lehetőségét az *Ákr.* 116. § (1) bekezdésének megfelelően az *Eütv.* 164/A. § (2) bekezdése mondja ki, mely szerint "A (3) és (5) bekezdésben nem említett beavatkozással nem járó vizsgálat esetében a szakmai-etikai engedélyről az emberen végzett orvostudományi kutatásokról szóló kormányrendelet szerinti kutatás-etikai bizottság a kérelem megérkezését követő naptól számított negyvenöt napon belül dönt. A döntés ellen fellebbezésnek van helye, a másodfokú eljárást az ETT elnöksége folytatja le."

A fellebbezési eljárás illetékmentességét *az illetékekről szóló 1990. évi XCIII. Törvény* 67. § (3)-(5) bekezdései alapján a *23/2002. EüM. rend.* 15. §-a és 20/R. § (1) bekezdése mondja ki, tekintettel arra, hogy a kérelmezett kutatás nem kereskedelmi vizsgálat a *23/2002. EüM. rend.* 20/B. § f) pontja alapján.

A fellebbezés előterjesztésére az *Ákr.* 118. § (3) bekezdése vonatkozik.

Budapest, 2022. április 12.

P.H.

Prof. Dr. Schaff Zsuzsa ETT TUKEB elnök nevében kiadmányozza:

Dr. Kardon Tamás ETT TUKEB titkár

Kapják:
1./ Kutatásvezető
2./ Intézetvezető
3./ Intézményvezető
4./ Irattár

Ügyiratszám: IV/2562- 3 /2022/EKU

Submission of the doctoral dissertation and declaration of the originality of the dissertation

The undersigned

Name: Anna Dávidovics
Maiden name: Anna Dávidovics
Mother's maiden name: Dr. Judit Varga
Place and date of birth: Pécs, 23/07/1988
on this day submitted my doctoral dissertation entitled

There Is Nothing Like a DREEM to Create the Future of Medical Education: International and Hungarian Medical and Dentistry Students' Perceptions on their Learning Environment in Hungary

to the

PR-1. Frontiers of Health Science Programme
of the Doctoral School of Health Sciences, Faculty of Health Sciences, University of Pécs.

Name(s) of the supervisors: Dr. Timea Németh

At the same time, I declare that
- I have not submitted my doctoral dissertation to any other Doctoral School (neither in this country nor abroad),
- my application for degree earning has not been rejected in the past two years,
- in the past two years I have not had unsuccessful doctoral procedures,
- my doctoral degree has not been withdrawn in the past five years,
- my dissertation is independent work, I have not presented others' intellectual work as mine, the references are definite and full, on preparation of the dissertation I have not used false or falsified data.

Dated: 29/06/2023

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Candidate

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Supervisor Co-supervisor