Maturity Model for Assessment of Personalization of Higher Education

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Abstract: The paper presents the Education Personalization Maturity Model, developed to provide higher education institutions with a tool for assessment of the level of their personalized approach to their students. These days students tend to be much more engaged in the education process; they want their preferences to be considered in not only in the learning process but in all aspects connected with educational institutions. The presented model covers four major key process areas of practices at higher education institutions: students' online platform/website, courses and fields of study, research activity, and other extracurricular activities. The Education Personalization Maturity Model is used to assess the personalization of 51 higher education institutions in 25 countries. The results of this assessment are presented and analyzed in the paper.

1 INTRODUCTION

There is no doubt that higher education worldwide has undergone significant changes not only within the last century but even within the last decade. Governments have been changing their educational policies, higher education institutions (HEIs) have been adapting to these novelties as well as introducing their internal regulations – to stay competitive and attractive for students.

Moreover, the attitude of students towards education has changed. They are now perceived as customers and active players in establishing their learning path (Orîndaru, 2015). These days, when talking about the quality of higher education, we talk about a significantly increasing engagement of students. Such engagement is considered a measure of the quality of an educational institution: students of a good institution are supposed to be actively involved in educationally purposeful activities (Quaye & Harper, 2014). It is seen as the premise of students' happiness. Researchers state that guaranteeing students' happiness as a result of their development is much more crucial than just satisfying students' needs as consumers. Students who are "happy" are more content with their engagement in educational experiences, while those who are just "satisfied" are more concerned with how education services were delivered rather than in their involvement with the process (Dean & Gibbs, 2015).

One of the ways to make students happier about their educational path is to provide them with a personalized approach of their HEIs towards their preferences and aspirations. Developing personalized education for students means, among others: allowing them to tailor their study program as they desire (at least to some extent) (Rollande & Grundspenkis, 2016); providing them with tutors or mentors who help students define their educational and professional path (Rollande, 2015); compromising with students and adapting study plans to their preferences (as much as it is possible) so that students could combine studies with work or other important activities (Grundspenkis, 2010); increasing the number of workshops and other practical activities to make students familiar with the business environment (Zhu, 2016); motivating them to be curious, to conduct research; developing good infrastructure with all necessary facilities (e.g., sports, computers, internet, library, etc.) (Kabak & Dagdeviren, 2014), and many others.

When students study, participate in research projects, take part in internships and exchange

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programs, realize projects, or participate in any other activities offered by their educational institutions, they form some kind of a portfolio of all their experience, knowledge, skills, and abilities. In other words, it can be called a profile or, specifically, a student's Individual Higher Education Profile (also – Individual Profile). This Individual Profile of a student is most effectively formed with the personalized approach of educational institutions towards their students when HEIs provide students with the elements of personalization discussed in the previous paragraph (and many more). To make sure the students are content with their educational path realization, HEIs need to be able to answer such questions as: what are the first steps towards education personalization development; what rights and privileges the students may have, and in what activities there should be restrictions; how to evaluate whether the approach towards students is personalized, and to what extent; and many more.

The objective of this paper is to present a tool for assessment of the level of personalization of education at higher education institutions, developed by the authors, which is the Education Personalization Maturity Model (EPMM).

1.1 Maturity Models in HEIs

To examine the maturity models for educational institutions, developed by researcher in the last decade, the authors conducted the Systematic Literature Review (SLR). In the process of selection by title, abstract and paper content (in accordance with the PRISMA guidelines[3]), the authors received 43 papers eligible for further review. In these works, the authors revealed 13 maturity models created for higher education institutions (Table 1). These models are dedicated to the maturity of e-learning, Information and Communication Technology (ICT), planning and assessment of learning processes, and some other processes that run at higher education institutions.

Due to the fact that the literature review did not reveal any maturity model dedicated to education personalization or student's Individual Profile development, the authors see a research gap which may be filled with the suggested EPMM model, presented further in this paper.

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[3] "Preferred Reporting Items for Systematic Reviews and Meta-Analyses". https://prisma-statement.org. [Accessed: 20.08.2022.

Table 1: Maturity models for HEIs: literature review results.

Author(s)	Maturity model
E-learning maturity	
(Nsamba, 2019)	Maturity Assessment Framework for Open Distance E-Learning (MAFODeL)
(Marshall & Mitchell, 2004), (Marshall, 2010)	E-Learning Maturity Model (eMM)
(Penafiel et al., 2017)	Contribution to the eMM with the inclusion of a new Key Process Area – Accessibility
(Hong & Xinyi, 2019)	E-learning Process Capability Maturity Model (EPCMM)
ICT maturity	
(Durek, Kadoic, & Begicevic Redep, 2018)	Digital Maturity Framework for Higher Education Institutions (DMFHEI)
(Aliyu et al., 2020)	Holistic Cybersecurity Maturity Assessment Framework (HCYMAF)
Learning process planning and assessment maturity	
(Thong, Yusmadi, Rusli, & Nor Hayati, 2012), (Thong, Jusoh, Abdullah, & Alwi, 2013)	Curriculum Design Maturity Model (CDMM)
(Reçi & Bollin, 2017), (Reçi & Bollin, 2019)	Teaching Maturity Model (TeaM)
(Enke, Glass, & Metternich, 2017), (Enke et al., 2017)	Maturity Model for Learning Factories
Other processes maturity	
(Carvalho, Pereira, & Rocha, 2019)	Higher Education Institutions Maturity Model (HEIMM)
(Secundo, Elena-Perez, Martinaitis, & Leitner, 2015)	Intellectual Capital Maturity Model (ICMM) for HEIs
(Matkovic, Pavlicevic, & Tumbas, 2017)	Business Process Modeling Maturity and Adoption Model for HEIs
(Boughzala & de Vreede, 2015)	Collaboration Maturity Model (Col-MM)

The structure of the paper is as follows: Section 2 contains the methodology of the EPMM development; in Section 3 structure of the EPMM is presented; in Section 4, the authors briefly introduce the results of verification of the developed Model at 51 HEIs; in Discussion the authors conclude on the obtained results of EPMM verification and distinguish the contribution of this work, its limitations, and potential further research.

2 EDUCATION PERSONALIZATION MATURITY MODEL DEVELOPMENT METHODOLOGY

2.1 Design Decisions when Developing the Education Personalization Maturity Model

The section presents the methodology of building the Education Personalization Maturity Model developed by the authors. The primary objective of the EPMM Model development is to identify the practices related to the personalization of education at HEIs and to create the methodology of assessment of the quality of these practices' realization.

In 2011, (Mettler, 2011) suggested a framework for maturity model design process, which consists of five iterative steps: identify need or new opportunity, define scope, design model, evaluate design, and reflect evolution. The authors used this methodology when making decisions for the EPMM Model (Rizun, 2021).

At the stage "Identify need or new opportunity", the authors see the EPMM Model as the "*emerging*" and "*new*" one – because no maturity model for personalization of higher education has been developed so far. The "Define scope" decisions are supposed to set the outer boundaries for the EPMM Model application and use (de Bruin et al., 2005). The authors' choices are: "*specific issue*" (applied only for HEIs), "*inter-organizational*" (covers internal processes of HEIs and their cooperation with other organizations), and "*both*" the Management- and Technology-oriented staff of HEIs. In the "Design model" activity, the EPMM Model is characterized as follows: a "*process-oriented*" and "*multi-dimensional*" (focuses on several objectives) model, where the design process is a "*combination*" of theory (e.g., literature review) and practice (the experts' knowledge). The design product of the EPMM Model is a "*combination*" of textual description and software instantiation. The EPMM Model is supposed to be implemented by HEIs with no third parties engaged, so the application method is "*self-assessment*". Finally, the "*combination*" of management, staff, and business partners, as respondents of the EPMM Model, was selected. The subject of evaluation in the "Evaluate design" stage is "*design product*". The evaluation and verification of the EPMM Model are to be conducted before it is implemented, so the

option of "ex-ante" evaluation is selected. Additionally, the evaluation is to be performed with the "*naturalistic*" method, i.e., it should be based on the experience and reflection of real users (Carvalho et al., 2019). In the "Reflect evolution" activity, the authors have selected "*continuous*" evolution. The authors also believe that the modifications in the EPMM Model can be implemented by its users, which leads to the "external/open" structure of change.

2.2 Information Basis of the EPMM Model Development

In the process of developing the Education Personalization Maturity Model, the authors used the following primary sources of information:

1. Literature on maturity models in general and those developed for educational institutions. It provided the authors with knowledge on how the models should be constructed and what are the obligatory and optional constructs of a maturity model.

2. Design decisions developed in (Mettler, 2011), discussed above. They allowed the authors to define the issues of particular importance in the process of maturity model design and to organize and document this process.

3. Resolutions, ordinances, regulations, and other official documents, issued by the authorities of the University of Economics in Katowice (UEKat), which is the authors' affiliation. On the basis of these documents, the authors built a picture of UEKat policy as for personalized approach toward students. Good practices were analyzed and used in the EPMM Model as examples of high levels of personalization maturity; practices that might require improvement were put to the lower levels of maturity.

4. Opinions of students of a few Polish HEIs, obtained through a questionnaire survey.

Since the primary focus of the paper is the final version of the EPMM Model, not each step of its development, the detailed questionnaire results are not presented. As stated above, they found reflection in the EPMM Model structure.

3 EDUCATION PERSONALIZATION MATURITY MODEL STRUCTURE

Researchers distinguish three major components that

define a maturity model (Nelson et al., 2014): content, its quality, and the indicators of maturity status. The content is formed by practices, processes, and categories. Under the term "practices", the authors understand the policies and activities of a HEI on specific issues, which are the focus of a particular maturity model or framework. In the case of the EPMM, the focus is on the practices connected with personalization development. Practices of a similar kind could be synthesized into broader process categories or key process areas (KPAs).

The basic structure of the EPMM is presented in Figure 1.
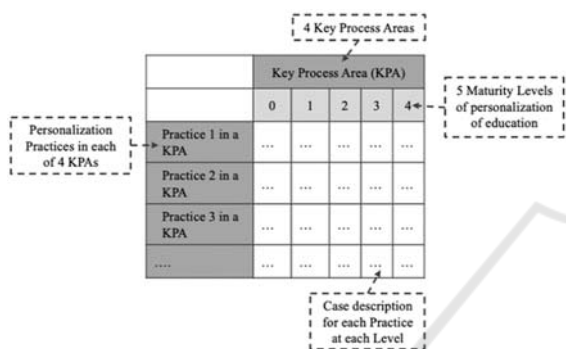
Source: own

Figure 1: Basic structure of the EPMM Model.

The authors distinguish 34 practices connected with the personalization of education. That is, with the realization of these practices, personalization of students' education at HEIs is formed and/or improved. These 34 practices are grouped into four KPAs. Each of the practices within each of the four KPAs contains descriptions of five cases, each

referring to a certain maturity level (from 0 to 4, as shown in Table 2). Each case is a situation suggested to occur at the analyzed HEI; the higher the level, the more expanded the description of the case is, i.e., the more advanced personalization of education is observed at the selected HEI.

3.1 Levels of Maturity

As stated in the literature, organizations may be characterized by levels of maturity or by dimensions (Marshall, 2010). In dimensions, a five-point adequacy scale is used to evaluate the quality of performed practices (Anicic & Divjak, 2020). The scale of maturity levels starts with level 1, which characterizes the maturity of an organization as the one that exists at an initial level. It is supposed that at this level, some practices expected to be realized, are present, but there is no system, and the realization is somewhat chaotic and poorly controlled.

However, the authors consider that it might be reasonable to define a level of maturity characterized as zero maturity – for an organization that has not made a single step toward developing a particular practice analyzed. The authors' suggestion is to name this level as "*not assessed* (0)" – referring to the first of the values of maturity assessment criteria (not assessed, initial, partially adequate, largely adequate, fully adequate). Therefore, the authors suggest modifying a more standard scale of maturity levels, introducing a "zero" or "nor assessed" level of maturity of personalization of education at higher education institutions.

The other amendment to the maturity levels, suggested by the authors, is merging the levels

Table 2: Maturity levels in the Education Personalization Maturity Model.

Levels of personalization maturity	Description of the levels
Not assessed (0)	There is no evidence of personalization of education at the selected HEI.
Initial / ad hoc (1)	Few processes connected with personalization are defined, but much depends on individual effort and will of a participant in the processes involved. Realization of practices is not systematic, and there is no centralized control over them.
Repeatable (2)	Basic management is established. Some processes are consistent, but there is still no discipline for all the processes and sub-processes that might contribute to personalization development.
Defined & managed (3)	Development of personalization is standard, consistent, and predictable. Practices are documented and integrated into standard processes. However, the selected HEI lacks suggestions for potential improvement of the practices connected with personalization. Realization of practices might not be connected with the external environment.
Optimizing (4)	The process of personalization is being constantly improved. Personalization practices are formally defined. All practices are controlled and documented. External environment of the selected HEI is actively engaged in personalization development.

Source: own, based on (Anicic & Divjak, 2020)

"defined" and "managed" into one. The authors give it a simple name "defined and managed". It is suggested that at this level of personalization, all the processes, sub-processes, and different activities, are already clearly defined and precisely controlled, yet the selected educational institution is supposed to remain at the same stage of personalization development, and there is no improvement observed.

Table 2 contains the authors' version of the five levels of maturity applied in the EPMM.

3.2 Key Process Areas and Practices

Researchers distinguish three major components that define a maturity model (Nelson et al., 2014): content, its quality, and the indicators of maturity status. The content is formed by practices, processes, and categories. Under the term "practices", the authors understand the policies and activities of a HEI on specific issues, which are the focus of a particular maturity model or framework. In the case of the EPMM Model, the focus is on the practices connected with personalization development. Practices of a similar kind could be synthesized into broader process categories or key process areas.

The authors distinguished *34 practices* connected with the personalization of education. That is, with the realization of these practices, personalization of students' education at HEIs is formed and/or improved. These 34 practices are grouped into *four key process areas*. Each of the practices within *each of the four KPAs contains descriptions of five cases*, each referring to a certain level of maturity (from 0 to 4, as shown in Table 2). Each case is a situation suggested to occur at the analyzed HEI; the higher the level, the more expanded the description of the case is, i.e., the more advanced personalization of education is observed at the selected HEI.

A list of the defined key process areas is presented in Table 3. In Tables 4-7, practices for each KPA are enumerated. In addition, these tables include ratings or, better say, weights of each of the KPAs and practices. The higher the weight, the more important a certain KPA or practice is supposed to be, and the greater its role is in the development of personalization of education at HEIs.

KPA1 – "Students' Platform" (SPL), contains seven practices (Table 4). Under the Students' Platform, the authors understand a separate website, or a part of HEI's website, which is dedicated only to students' needs like providing them with information about fields of study and specializations, elective and obligatory courses, practices, and internships, exams and grades, conferences, social events, changes in

schedule or any other organizational issues; submitting documents or registration forms; and other issues that might be necessary for students of a particular educational institution.

Table 3: Key process areas in the EPMM Model.

Key process area	Acronym	Rating	Practices inside the KPA
Students' Platform	SPL	0,400	SPL1 – 7
Courses and Fields of Study	CFS	0,300	CFS 1 – 15
Research Activity	RSA	0,100	RSA 1 – 4
Extracurricular Activities	EXA	0,200	EXA 1 – 9

Source: own

Table 4: Students Platform KPA: practices.

Acronym	Practice statement	Rating
SPL1	Students' platform availability	0,250
SPL2	Course schedule available online	0,214
SPL3	Schedule of exams and other evaluation works available online	0,143
SPL4	Grades available online	0,179
SPL5	Course materials availability online	0,036
SPL6	Registration forms availability online	0,107
SPL7	Students' platform in a mobile application version	0,071

Source: own

Table 5: Courses and Fields of Study KPA: practices.

Acronym	Practice statement	Rating
CFS1	Course grades transfer	0,125
CFS2	Changing the field of study	0,117
CFS3	Double diploma programs	0,092
CFS4	Exchange programs courses	0,075
CFS5	Course transfer in exchange programs	0,100
CFS6	Individual study plan	0,033
CFS7	E-learning 2.0 (informal)	0,058
CFS8	E-learning organization	0,067
CFS9	Evaluation works	0,083
CFS10	Course teachers	0,042
CFS11	Elective courses content	0,017
CFS12	Elective courses number	0,008
CFS13	Study plan content	0,025
CFS14	Students' opinions	0,050
CFS15	Course schedule flexibility	0,108

Source: own

KPA2 – "Courses and Fields of Study" (CFS), contains 15 practices (Table 5), being the largest key process area in the model. This is the KPA dedicated to the issues of selecting courses, transferring between specializations and fields of study or between institutions, expressing preferences and opinions on academic teachers and their teaching methods, learning online, and others.

KPA3 – "Research Activity" (RSA), has only four practices in it (Table 6). These practices consider theses of bachelor's and master's levels, students' participation in scientific conferences, membership in scientific organizations, and the overall research activity of students.

Table 6: Research Activity KPA: practices.

Acronym	Practice statement	Rating
RSA1	Scientific tutorship	0,200
RSA2	Students' scientific organizations[4]	0,100
RSA3	Scientific conferences	0,300
RSA4	Bachelor's / master's thesis	0,400

Source: own

The last key process area (KPA4) – "Extracurricular Activities" (EXA), includes eight practices (Table 7). It covers, among others: students' personal development, engagement in various activities and events, providing students with access to the internet and information databases, and integration of students from exchange programs.

As stated above, all practices contain description of cases for five maturity levels (0-4). Since it is not possible to fit the tables with cases for all practices into the paper, the authors chose to provide examples of case descriptions, one per each key process area.

Table 7: Extracurricular Activities KPA: practices.

Acronym	Practice statement	Rating
EXA1	Personal development	0,222
EXA2	Students' organizations (non-scientific)	0,056
EXA3	Exchange students' engagement	0,083
EXA4	Infrastructure	0,194
EXA5	Access to databases and electronic resources	0,167
EXA6	Students' decision-making	0,139
EXA7	Practices and internships	0,111
EXA8	Volunteering	0,028

Source: own

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[4] Scientific circles, research groups, research seminars, research laboratories, etc.

Practice SPL1 (Students' platform availability), level 0 (Not assessed): "*There is no platform or website with information for students at the HEI*".

Practice CFS9 (Evaluation works), level 1 (Initial): "*The HEI sets crediting formats for all courses, and they cannot be changed on students' request. The information is given in the official course description*".

Practice RSA1 (Scientific tutorship), level 2 (Repeatable): "*Students can apply for additional scientific tuition only when they begin working on bachelor's or master's thesis. Students' grades are not taken into consideration. The HEI appoints the tutor*".

And finally, practice EXA5 (Access to databases and electronic resources), level 4 (Optimizing): "*The HEI provides students with access to most (or all) of the largest databases or other electronic resources. Access is also possible from students' private computers (e.g., using VPN connection or a special account)*".

Procedure of verification of the EPMM model with all the practices and cases, which was conducted at 51 higher education institutions, is discussed further.

4 EDUCATION PERSONALIZATION MATURITY MODEL VERIFICATION

Verification of the Education Personalization Maturity Model, developed by the authors, was conducted to assess the maturity of education personalization at higher education institutions in Poland and abroad. This assessment was conducted with the help of a questionnaire that was distributed among colleagues from different HEIs worldwide. The sampling for this survey is a non-random convenience sampling since the respondents were selected based on their experience, their places of work, as well as on the convenience of reaching them out, and their willingness to participate in the survey.

As a result of the survey, the authors obtained 51 responses, i.e., 51 higher education institutions were assessed using the Education Personalization Maturity Model (I = 51). These 51 institutions belong to 25 countries (C = 25) in Europe (68%), Asia (16%), South America (12%), and Africa (4%). The authors

have applied Alpha-3 codes for countries, and further, these codes are used to encode educational institutions from particular countries.

Table 8 provides information about the positions the respondents occupy at their institutions. The question about the position was a multiple-choice one, so there was a possibility for a respondent to claim to be, for instance, both an academic teacher and a member of university authorities.

Table 8: Distribution of respondents' positions at their HEIs (I = 51).

Positions	Number of answers	% of total number of HEIs
Academic Teacher	33	64,71%
Academic Teacher, Research Worker	9	17,65%
Academic Teacher, University Authorities Member	3	5,88%
Academic Teacher, Administrative Staff Member	2	3,92%
Administrative Staff Member	2	3,92%
University Authorities Member	2	3,92%
Total number of answers = number of HEIs	51	

4.1 Higher Education Institutions Assessment Results

To assess the maturity of individualization of a HEI, the respondents had to select one of the five cases (referring to five maturity levels) for each of the practices within each of the key process areas.

All the answers from the Google Forms questionnaire were gathered in Google Sheets, where the authors then manually connected all the answer options with the corresponding number of maturity level (from 0 to 4). Thus, the personalization maturity levels for each practice within the four KPAs appeared. In the next step, maturity levels were calculated for each key process area – by calculating the weighted average with the help of the ratings of practices (presented in Tables 4-7). Further, the ratings of the KPAs (presented in Table 3) were applied in the weighted average to calculate the final personalization maturity levels for the 51 HEIs. The results of the described calculations are presented in Table 10. The aggregated statistics for 51 higher education institutions are given in Table 9.

Table 9: Personalization maturity assessment: aggregated results (I=51).

Level of personalization maturity	Number of HEIs	% of total number of HEIs
3	27	52,94%
2	18	35,29%
4	3	5,88%
1	3	5,88%
0	0	0,00%

Source: own

These final results of the personalization maturity assessment allow the authors to distinguish some HEIs that had developed personalization for their students and had put it on a high level, and, on the contrary – that are still at the beginning of personalization development and have a lot of good practices to introduce.

Of the 51 HEIs assessed, most (27; 52,94%) obtained the level of maturity 3 "Defined and managed", which means that they had developed most of the personalization practices considered in the EPMM, but still have options for improvement. The fourth place is taken by three HEIs with level 1 "Initial / ad hoc" (5,88%). These institutions are characterized as those having only a few personalization practices realized, without any common system, and supported mainly by individual efforts of academic and administrative staff.

Within the "Students' Platform" KPA, most institutions (24; 47,06%) have the same high level of personalization (level 4 or close to it) related to the platform for students. For all institutions, the weakest point seems to be the mobile application with all necessary information for students, with frequent updates and notifications. One more issue, which appears to be insufficiently developed, is the schedule of courses and exams available and updated online (when students do not have to download, for instance, a PDF file from a website and compare it with previous versions to reveal changes).

Levels of practices development within the "Courses and Fields of Study" KPA vary rather significantly. Most common problems in this KPA, for all institutions, are: 1) informal e-learning – taking online courses on platforms like Coursera[5], Udemy[6], Edx[7], Mooc[8] etc., is not forbidden by HEIs, but it is not (or poorly) motivated, supported, and rewarded; 2) internal e-learning – HEIs either do not offer any courses provided online, or have very few of them, probably with low possibility to replace traditional

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[5] https://www.coursera.org
[6] https://www.udemy.com

[7] https://www.edx.org
[8] https://www.mooc.org

courses with their online version; 3) choosing teachers – students do not have any influence on the process of assigning teachers to courses, or, probably, they can choose teachers for very few courses (like courses that are additionally selected); 4) number of elective courses – from 0% to only 50% of courses students are offered within their study programs can be selected by students themselves on the basis of their preferences, and the list to choose from is quite small; the rest are set by HEIs authorities; 5) course schedule flexibility – student have zero to low influence of the schedule of courses they take; they cannot apply for changes to be able to combine education with work or other activities efficiently. The most well-developed practices in this KPA are: 1) exchange programs – as host institutions in programs like Erasmus, HEIs offer a lot of courses and do not forbid to take more courses than it is set by the program if students are interested in getting more knowledge and skills; 2) variety of elective courses – such courses can belong to different specialization and fields of study at the selected HEI, they can be taught in foreign languages, and their number is not limited by the HEI; 3) consideration of students' opinions – courses evaluation is conducted every semester, students' opinions about teachers, content, learning methods, etc., are gathered; information is given to Heads of Departments and to teachers to conduct improvements. Polish HEIs mostly take levels between 2 and 3 in this KPA.

As for the "Research Activity" KPA, 49,02% of assessed HEIs take level 3 ("Defined and managed") for the development of practices connected with supporting their students' research activity. For 50,98% of the educational institutions, the practice of scientific tutorship for students is not developed (levels 0 and 1). This means that either there is no tutorship at all, or tutors can be appointed only at the master's degree, only to students with a high average grade, and, perhaps, only by HEI authorities with no option for students to make their own choice. One more weak point in the personalization of research activity is the practice of running scientific organizations. 19,61% of institutions have this practice at level 0 ("Not assessed"). These HEIs do not run any students' scientific organization (e.g., scientific circles, laboratories, etc.). Two other practices remaining in this KPA are well-developed at 68,63% of educational institutions and poorly developed at 31,37%. Therefore, 68,63% of HEIs regularly organize scientific conferences for their students to participate in, with many urgent topics covered; HEIs may finance the participation of their students in conferences organized by other

Table 10: Personalization maturity assessment results.

HEI	KPA1 - SPL	KPA2 - CFS	KPA3 - RSA	KPA4 - EXA	Level of the HEI
ALB-1	3	2	2	3	3
ALB-2	3	1	2	2	2
BRA-1	3	2	4	4	3
BGR-1	1	2	2	3	2
CZE-1	4	2	3	4	2
DEU-1	3	3	3	3	3
EGY-1	3	1	2	3	3
FRA-1	4	2	0	2	2
GRC-1	3	2	3	3	3
GRC-2	3	1	1	2	3
HUN-1	3	2	3	3	2
HUN-2	3	2	2	3	3
IRL-1	3	2	1	4	3
IRL-2	3	2	2	3	3
ITA-1	3	2	0	2	3
KAZ-1	3	2	3	3	2
OMN-1	4	3	2	3	3
OMN-2	4	1	1	2	3
PRY-1	2	1	1	2	1
POL-1	3	1	3	3	2
POL-2	4	3	4	3	2
POL-3	2	2	3	3	2
POL-4	4	3	3	3	3
POL-5	4	2	2	3	3
POL-6	1	1	1	1	1
POL-7	2	1	3	2	2
POL-8	3	3	3	3	3
POL-9	4	3	4	4	4
POL-10	4	3	3	4	4
POL-11	4	3	3	4	4
POL-12	2	2	3	4	2
POL-13	2	2	2	2	2
POL-14	3	3	4	4	3
PRT-1	3	2	1	3	2
PRT-2	4	2	4	3	3
ROU-1	4	3	3	3	3
ROU-2	4	3	4	3	3
RUS-1	3	3	3	3	3
RUS-2	3	3	3	3	3
SVK-1	2	1	1	1	1
SVN-1	3	2	2	1	2
ESP-1	3	2	1	3	2
ESP-2	4	1	2	3	3
ESP-3	3	1	3	3	2
TUR-1	3	3	2	3	3
UKR-1	3	3	3	2	3
UKR-2	3	3	3	3	3
UKR-3	2	2	3	2	2
UKR-4	3	3	3	3	3

Source: own

institutions and may reward participation with extra grades for some courses. Also, at 68,63% of higher education institutions, students have the freedom of selecting thesis topics themselves (it is not forced by the authorities), and the scientific area of these topics is not limited; thesis can be supervised by business representatives to make the research more related to practice.

Finally, analyzing the "Extracurricular Activities" KPA, it can be seen that 70,51% of the assessed institutions appear to take levels 3 ("Defined and managed") and 4 ("Optimizing") of personalization maturity. One of the poorly developed practices here is "Volunteering". Following the EPMM cases, such a level means that HEIs do not engage students in any volunteer programs, nor do they motivate and reward participation; they only provide students with information about existing volunteer programs and may be engaged in some programs. In turn, the strongest practice for 70,51% of HEIs is "Personal development", which means that these institutions regularly invite speakers from business units to conduct classes (workshops, lectures, etc.) for their students, also engaging students in the search of the most interesting speakers; they support students in problems of personal development (tutorship, mentorship), and frequently inform them about the most attractive career options offered in the region (or whole country).

5 DISCUSSION

Nowadays, it is crucial to provide students with the proper approach toward their preferences and aspirations for education and personal and professional development to make them feel content with their experience at higher education institutions. Therefore, it is necessary for educational institutions 1) to become aware of whether they give students enough freedom and flexibility for the realization of their plans and ambitions; 2) to be able to compare their personalization policy with other educational institutions; and 3) to learn about ways of making their personalization policy more effective.

This paper presents the Education Personalization Maturity Model developed to assist HEIs in the assessment of the level of their personalized approach toward their students.

5.1 Contribution of the Research

The results provided by the Education Personalization Maturity Model are useful, first of all,

for the higher educational institutions that were engaged in the survey since the conclusions obtained allow to pay attention to the weak places of the process of education personalization development. Moreover, the authors consider that the descriptions of cases presented for each practice within each key process area of the EPMM can serve as kinds of prompts or small guidelines on what should be changed or what options should be added to provide students with a higher level of personalized approach towards their Individual Profile formation. Additionally, the authors expect the EPMM to be of interest to administrative and management staff of higher educational institutions in countries of Europe and beyond; the example of 51 HEIs that already took part in the assessment of personalization should serve as proof that the EPMM can effectively assist in personalization assessment, at least at the initial level.

5.2 Limitations of the Research

One of the limitations of the developed EPMM is that it may miss some practices that might be considered important for students of HEIs. As stated, the Model was developed on the basis of students' opinions, and the questionnaire presented to them was quite extensive. Yet, there is a chance that with more opinions, some new practices would appear. The authors also believe that a survey conducted among academic teachers may have given interesting results.

The other limitation of the EPMM consists in the necessity of finding experts to use it. An employee of a HEI, who is going to use the Model to assess personalization at that particular institution, should possess knowledge about various activities taking place there: didactic process and research, sports and other activities, mobility programs and cooperation, etc.

The limitation of verification of the EPMM, presented in this paper, is that only one expert from each HEI used the EPMM. For a better, complete picture of each institution, at least a few opinions about each HEI would be necessary.

5.3 Avenues for Future Research

As mentioned earlier, the EPMM is supposed to have a continuous process of evolution; it can be modified by the authors or by other users (like the administrative staff of a HEI) that would like to apply the Model. Amendments to the EPMM can be conducted to adjust it to the specificity of a particular HEI or to the education policy of a certain country. The authors also believe that the changes that might

happen to the EPMM will be caused by the natural changes in higher education – connected with the flow of time, with the progress of IT, with higher demands and greater ambitions of students, with the constants self-development of teachers and improvement of their teaching techniques, etc.

Therefore, the authors distinguish two directions for future work. The first one would be the modification and improvement of the Education Personalization Maturity Model. The second direction would be the development of guidelines for personalization maturity improvement. For now, the only piece of advice that can be obtained from the EPMM can be found in the descriptions of particular practices. Descriptions of the levels higher than the one defined for the analyzed higher education institution can serve as small prompts on what measures to take to improve the level of personalization and make students of this institution more content. Thus, the extended guidelines on how to improve personalization by performing changes in particular KPAs of institutions' activity or in particular practices that they perform would be a valuable potential contribution to higher education management.

5.4 Final Remarks

Results of analysis of the selected higher education institutions with the help of the Education Personalization Maturity Model, developed by the authors, lead to a conclusion that HEIs, represented by their administrative and management staff, may benefit from the application of the EPMM. Implementation of the Model enables assessment of the level (i.e., degree) of the personalized approach that higher education institutions provide for their students. It also provides suggestions on possible ways of improving the current situation with the personalization of education.

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