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TECHNICAL FACULTY
"MIHAJLO PUPIN"
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PROCEEDINGS

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With this publication, the CD with all papers from the International Conference on Information Technology and Development of Education, ITRO 2020 is also published.

INTRODUCTION

For the first time the conference „Information Technology and Development of Education – ITRO 2020“ has been held on line, due to the covid-19 pandemic circumstances. The main goal of the conference was scientific discussion and interchange of information and experiences about the implementation of IT solutions in educational technology and the impact of different kinds of crises on children's access to quality education. Thematic fields of the conference are aligned with general trends in education, especially in technical sciences.

At the conference, within the poster session and at the plenary presentation, problems and, conditions were presented in the following areas: Theoretical and methodological issues of modern teaching, Personalization and learning styles, Social networks and their impact on education, Safety and security of children on the Internet, Curriculum of modern teaching, Methodological issues of teaching natural and technical sciences, Lifelong learning and professional development of teachers, E-learning, Management in education, Development and impact of information technology on teaching, Information and communication infrastructure in the teaching process, Improving the competencies of teachers and students. A significant number of papers were related to the implementation of teaching in the context of the COVID 19 pandemic.

At the end of the conference, and based on the papers of our participants, we conclude that the main focus points of this moment in education, which in one of the papers is called the "digital revolution", are the following:

- intensive work on increasing the level of responsibility of all participants in education,
- intensive work on the digitization of teaching content in order to overcome barriers and problems, of which one is certainly the dominant which is students motivation,
- intensive work on increasing competencies and professional support to teachers in the circumstances of a pandemic, different type of crisis and state of emergency,
- necessity of lifelong learning mechanisms,
- encouraging the research of attributes and relatively simple but sufficiently efficient approaches to assessing the metrics of the usability of educational technologies,
- encouraging the media to play a more active role in presenting the situation in the field of education professionally and objectively.

The ITRO Organizing Committee would like to thank the authors of papers, reviewers and participants in the Conference who have contributed to its tradition and successful realization.

We hope that next year our planet Earth will recover and that we will see each other live at the next conference.

We especially want to pay tribute to our late colleague professor Ivan Tasić PhD, as one of the founders of the ITRO conference. Our team thus suffered an irreparable loss, and his name will forever remain on the pages of the conference proceedings.

Chairman of the Organizing Committee

Ph.D Dragana Glušac

CONTENTS

SCIENTIFIC PAPERS

I. Tasić, M. Merdović, E. Terek, J. Rajković and M. Nikolić
THE INFLUENCE OF TEACHER COMMUNICATION SATISFACTION ON THE TEACHING PROCESS AND STUDENT DEVELOPMENT.....1

F. Dedić, N. Bijedić, E. Babović and D. Gašpar
STUDENT'S SUCCESS PREDICTION IN THE SECONDARY LEVEL OF EDUCATION USING A LINEAR REGRESSION MODEL 9

M. Đ. Adamović and D. V. Ivetić
GUIDELINES FOR DEVELOPMENT OF EDUTAINMENT VIDEO GAMES.....13

J. V. Buralieva and D. Stojanov
FOURIER ANALYSIS THROUGH EXAMPLES USING WOLFRAM MATHEMATICA.....17

R. Timovski, N. Koceska and S. Koceski
REVIEW: THE USE OF AUGMENTED AND VIRTUAL REALITY IN EDUCATION.....23

M. Lazić, M. Kovačević, N. Tasić and M. Pardanjac
IMPLEMENTATION OF THE UNIFIED INFORMATION SYSTEM OF EDUCATION IN HIGHER EDUCATION - SIGNIFICANCE AND EFFECTS.....29

D. Milosavljev, J. Stojanov, A. Grban and M. Kavalić
EDUCATION AND KNOWLEDGE IMPROVEMENT OF EMPLOYEES IN DRIVING SCHOOLS IN THE REPUBLIC OF SERBIA.....34

L. Bajrami and M. Ismaili
INCORPORATING DIGITAL MEDIA TO MOTIVATE STUDENTS IN EFL CLASSES.....40

N. Koceska, S. Koceski, B. Pucovski, V. K. Mitkovska and A. Lazovski
INVESTIGATING THE EFFECTS OF ONLINE AND FLIPPED CLASSROOM APPROACH DURING COVID-19 PANDEMIC 42

Lj. Kazi, S. Nadrljanski, G. Gecin, A. Kansara, Z. Kazi, B. Radulović and N. Chotaliya
RECOVERY OF PARTITIONED DATABASES BASED ON TIME STAMP DATA AND THE ROLE OF CRUD OPERATIONS: TWO EDUCATIONAL WEB APPLICATIONS 48

G. Molnár, Z. Námesztovszki and Z. Szűts
SWITCHING TO ONLINE EDUCATION, EXPERIENCES FROM HUNGARY AND SERBIA 55

L. K. Lazarova, M. Miteva and T. Zenku
TEACHING AND LEARNING MATHEMATICS DURING COVID PERIOD 60

G. Skondric, I. Hamulic and E. Mudnic
VERIFICATION OF USER BEHAVIAR MODEL IN P2P STORAGE DISTRIBUTED SYSTEM SIMULATIONS 66

M. Knežević, E. Brtka and I. Vecštejn
COMPARISON OF SOFTWARE APPLICATION DEVELOPMENT PROCEDURES IN C++ AND C# PROGRAMMING LANGUAGES 71

D. Radosav, N. Ljubojev, D. Milanov and M. Ercegovac
TEACHERS' AND STUDENTS' ATTITUDES TOWARDS DOING HOMEWORK ASSIGNMENTS ONLINE 75

A. Tasić, D. Karuović and A. Lunjić
SIGNIFICANCE AND APPLICATION WEB TECHNOLOGIES IN A TIME OF PANDEMIC 81

A. Belegisan, D. Glusac and D. Milanov
CORRELATION BETWEEN SCHOOL SUCCESS AND STUDENTS' DIGITAL COMPETENCIES 85

M. Bakator and D. Radosav
ANALYZING THE DIGITAL EDUCATION REVOLUTION 91

N. Koceska and S. Koceski
MEASURING THE IMPACT OF ONLINE LEARNING ON STUDENTS' SATISFACTION AND STUDENT OUTCOMES USING INTEGRATED MODEL 96

R. Timovski, T. A. Pacemska and B. Aleksov
USING WORLD REFERENCE LEVEL (WRL) IN THE PROCESS OF RECOGNIZING THE LEARNING OUTCOMES – CASE STUDY 102

D. Bikov, M. Pashinska and N. Stojkovikj
PARALLEL PROGRAMMING WITH CUDA AND MPI 107

D. Nedić, G. Jotanović, A. Krstić and T. Paunović
CALCULATING THE SURFACE OF A FLAT FIGURE–APPLICATION OF THE DEFINITE INTEGRAL IN THE GEOGEBRA PROGRAM PACKAGE 114

J. Stojanov, D. Drašković and Z. Zeljković
MATHEMATICAL PROBLEMS IN FINAL EXAMS THROUGH THE PISA PERSPECTIVE 120

S. Mihajlović, A. Kupusinac, D. Ivetić and I. Berković
THE USE OF PYTHON IN THE FIELD OF ARTIFICAL INTELLIGENCE 124

D. Stojanov, J. V. Buralieva and A. Velinov
AN IMPLEMENTATION OF A GENERIC SCHEME OF AN ARTIFICIAL NEURAL NETWORK AND THE BACKPROPAGATION ALGORITHM IN C++.....129

M. Bakator and D. Radosav
MANAGING EDUCATION IN THE COVID-19 ERA 134

D. Milanov, M. Ćoćkalo-Hronjec, I. Palinkaš, E. Descnica and J. Pekez
USAGE OF 3D SCANNING IN EDUCATION 138

R. Zamurović, M. Pardanjac and J. Barbarić
3D ANIMATION IN THE FILM INDUSTRY 142

A. Stojkov, Lj. Kazi and M. Blažić
SOFTWARE REENGINEERING WITH OBJECT-ORIENTED N-TIER ARCHITECTURE: CASE OF DESKTOP-TO-WEB TRANSFORMATION 146

M. Gaborov, D. Karuović, N. Jerković, N. Đordan and A. Felbab
ANALYSIS OF STUDENTS ATTITUDES ABOUT E – LEARNING.....151

B. Đorić, M. Blagojević, M. Papić and N. Stanković
STUDENTS' ATTITUDES REGARDING ONLINE LEARNING DURING COVID-19 PANDEMIC 157

Z. Kazi
SCHOOL MANAGEMENT IMPROVEMENT – PEDAGOGUE INFORMATION SYSTEM 161

M. Kavalić, D. Milosavljev, M. Pečujlija, S. Stanisavljev and R. Božić
LOCUS OF CONTROL IN THE FUNCTION OF IMPROVING WORK WITH STUDENTS – PILOT RESEARCH 166

A. Krstev, D. Serafimovski, T. Cekerovski, M. Cekerovski and D. Krstev
APPLICATION OF SENSORS IN REAL TIME SYSTEMS FOR OPTIMIZING INDUSTRIAL PROCESSES IN CHEMICAL FACILITIES 172

E. Karamazova, M. Kocaleva and T. Jusufi Zenku
STATISTICAL DATA FOR MODERN COMMUNICATION IN MATHEMATICS SUBJECTS AT FACULTY 181

M. Bakator and D. Radosav
RECAP ON SOCIAL MEDIA IMPACT ON EDUCATION 186

M. Kocaleva , B. Petrovska, N. Stojkovikj, A. Stojanova and B. Zlatanovska
REVIEW OF SENTINEL-2 APPLICATIONS 190

A. Krstev, D. Krstev and R. Polenakovik
MODELLING WITH STRUCTURAL EQUATION MODELLING – APPLICATION AND ISSUES 195

M. Gaborov, D. Radosav, A. Felbab and M. Mazalica
REPRESENTATION OF THE PROGRAMMING LANGUAGES IN IT SECTOR IN ZRENJANIN 201

M. Ismaili, L. Bajrami and S. Hasani
ENHANCING EFL STUDENTS' COMMUNICATIVE SKILLS BY USING LEARNING APPS 205

S. Dimitrijević and V. Devedžić
USABILITY EVALUATION IN SELECTING EDUCATIONAL TECHNOLOGY.....208

E. Tosheva
3D MODELING SOLUTIONS IN THE CLOUD.....215

Đ. Milošević, D. Subošić, P. Vasiljević, V. Nikolić and B. Markoski
POSSIBILITIES OF USING BIG DATA ANALYTIC IN POLICE WORK 217

J. Milenković, M. Pavlović, V. Nikolić, A. Jašić and V. Premčevski
EXAMPLE OF CLUSTERING USING K-MEANS METHOD IN PYTHON.....223

M. Stojičević, P. Vukašinović, V. Nikolić, B. Markoski and V. Premčevski
EXAMPLE OF FUZZY-BASED SEARCH MECHANISM IN PYTHON.....226

N. Pena, D. Karuović and J. Bushati
USER EXPERIENCE IN DEVELOPMENT OF THE WEB APPLICATIONS 231

B. Tomić, N. Milikić, J. Jovanović and V. Devedžić
EXAMINING ATTENDANCE, PERFORMANCE AND INTEREST IN A CS COURSE IN RELATION TO STUDENTS' ACHIEVEMENT GOAL ORIENTATION AND SELF-EVALUATION 235

B. Sobota, Š. Korečko, M. Hudák and M. Sivý
COLLABORATIVE VIRTUAL REALITY USAGE IN EDUCATIONAL AND TRAINING PROCESS 242

M. Lazić, M. Kovačević, N. Tasić and M. Pardanjac
METHODOLOGY FOR EXTERNAL QUALITY CONTROL OF HIGHER EDUCATION INSTITUTIONS.....248

S. Danilov, V. Makitan and M. Sisak
AN OVERVIEW OF THE MOST INFLUENTIAL ON-LINE MEDIA 253

T. Zorić, V. Makitan and E. Brtka
IT PROJECTS SUCCESS FACTORS.....259

Using World Reference Level (WRL) in the Process of Recognizing the Learning Outcomes – Case study

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Abstract: It is greatly important for the international knowledge recognition processes to understand the structure and importance of the learning outcomes, as well as qualification frameworks in different states, thus allowing easier knowledge mobility. European Union works a lot in this field, adopting conventions and regulations to be followed by the member states and aspirants. Probably the most important one is the Lisbon Recognition Convention (1997), concerning the higher education in Europe. Through UNESCO, a specific tool is created in order to suggest completely new approach in translating the qualifications gained in an understandable format for the countries, thus enabling easier and more precisely done mobility knowledge mobility between the countries. In this paper, the tool is applied to concrete study program at the GDU in Stip, MK.

I. PRESENT CONDITION IN EDUCATION

Analyzing the education systems and National Qualifications Frameworks (NQF) among countries in European Union, it is pretty sure that the differences are getting decreased. Still, there is a lot to be done and differences exist between some countries, but this seems to be reduced with the accessing processes and compliances of the domestic regulations with the ones from EU. National HE systems are organized in three cycles (European Qualification Framework – EQF levels 6-8) as defined by the Bologna Process (there are slight differences in some systems, such as Latvia and UK, having EQF level 5 – short cycle of HE programs (120-180ECTS), more focused on the acquisition of professional skills needed in labor market. In general, the workload of first cycle (EQF level 6) studies varies from 180 to 240 ECTS credits, known as Bachelor level studies. Holders of first cycle qualification have access to the second cycle studies in any field of study. The workload of second cycle (EQF level 7) studies is in the interval between 60 and 120 ECTS credits, and the titles of awarded qualifications varies. For Master's degree in Europe, the overall workload of studies in first and second cycles is not less than 300 ECTS credits. Graduates of the second cycle have access rights to doctoral level studies. The third cycle (EQF level 8) qualifications are awarded on the basis of original research. Although the nominal length of doctoral studies is three to four years, workload also can vary by country.

II. COUNTRIES' NQF SYSTEMS

All the countries have developed their NQF and have already harmonized (or are in a process) their NQF systems to the EQF, with respect to all of the conventions, regulations and documentation. In almost all of the countries, higher education qualifications are located on EQF 6-8 levels. The scope of all NQF is pretty comprehensive and includes the specific levels of qualifications that are conducted within the education and/or training process of the student. For indication of the particular qualification, level descriptors are used. Level descriptors give the necessary information to the learners, education and training providers, and of course the employers to position and value a specific qualification in relation to other qualifications. Most of the European countries have designed level descriptors for a comprehensive national qualification framework (NQF), covering multiple types and different levels of qualifications. This allows the level descriptors to embrace a wide range of institutions, stakeholders and their interests, traditions, cultures and values. In terms of fundamental level descriptors, we speak about:

- Knowledge (knowledge and understanding and its application, understanding and level of practice);
- Skills (generic cognitive skills communication numeracy and ICT skills);
- Competences (personal, professional, autonomy and responsibility, learning skills etc.).

A. What are learning outcomes?

Learning outcomes (LO) describe precisely what students will be able to demonstrate in terms of

knowledge, skills, competencies and values upon completion of a course, a span of several courses, or a complete study program. Clear articulation of learning outcomes serves as the foundation to evaluating the effectiveness of the teaching and learning process. According to the Bologna Process, it is mainly focused on pushing students in the process of acquiring knowledge, skills and competences that are favorable for their study program, thus making them meeting their self-development goals and social needs as good as it is possible. Therefore, LO are the main tool of the Bologna Process for improving mobility, transparency and recognition in the European Higher Education Area (EHEA). Certainly, in this direction are the familiar tools used in the process of mobility and awards recognition years backward, such as ECTS system of evaluation, Diploma Supplement (DS) and quality assurance processes. Practically, LO can be taken as a basis for a common understanding when comparing, assessing and recognizing qualifications offered in different education and qualification systems, needed for HE harmonization at international level.

There are several aspects that need to be met regarding LO:

- LO visibility – necessary information about all the sources (online or others) where the provided learning outcomes are published or are available to be seen and examined;
- LO definition – necessary information about the author who defines, body that approves and/or owns the provided learning outcomes;
- LO and QA - Information whether the learning outcomes are subject to quality assurance – positive or negative reply;
- LO vocabulary - Information about the terminology of learning outcomes – concepts or categories used when formulating the provided learning outcomes.

There are two categories of learning outcomes that can be analyzed: generic and specific. Researches have shown that generic learning outcomes have broader usage than the specific learning outcomes. Generic learning outcomes are referred to being transversal, soft or social knowledge, skills or competences whereas specific learning outcomes are more related to the particular field or subject of qualification. The most significant differences may be observed in terms of cases when learning outcomes are used and sources of learning outcomes differ by different countries and different education systems. Thus, the conclusion may be drawn that more attention should be paid to clear identification of sources for learning outcomes that may be used in recognition.

B. Stakeholders in knowledge mobility

The recognition of learning across boundaries is urgent and challenging for multiple different stakeholders in the process of knowledge mobility, as shown in figure 1.

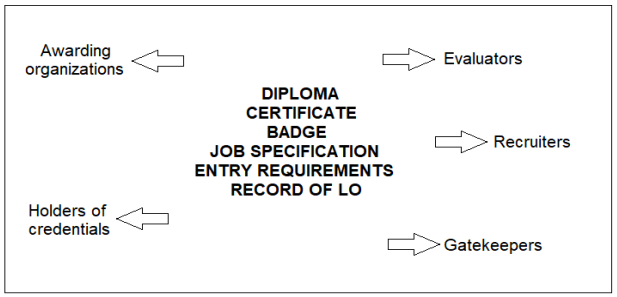

Figure 1. Knowledge mobility stakeholders

The largest goal to be achieved is automated (as it can be) international recognition, that embraces the need to work with different categories, types and levels of achievement, such as:

- life skills;
- application and responsibility;
- practicing knowledge gained;
- personal autonomy;
- context and systems;
- knowledge;
- skills;
- competences;
- learning;
- know-how etc.

So, this clearly goes above the concept of only knowledge, skills and competencies, into a broader (as it can be) picture of the person, both personal and professional, giving clear information about his ability to respond as qualified for something. Not only the specific skill or knowledge or competence is important, but also the level of achieving it, leading to the measurement of the difference between intended learning outcomes (what a learner is expected to know, be able to do and understand after having completed the learning process) and achieved learning outcomes (represented by the set of knowledge, skills and/or competences the learner has achieved and/or is able to demonstrate after completion of the learning process).

Two different recognition concepts can be analyzed:

- Recognition for the purpose of continuation of education (academic recognition), and
- Recognition for the purpose of professional engagement / employment (professional recognition).

Usually, authorities responsible for the different types of recognition differs on a state level, as well for the process of recognition of professional qualifications.

III. APPLICATION OF WRL TO A SPECIFIC STUDY PROGRAM

Countries need an international system (tool) which will be broad enough in several important spots:

- Speaking in a common language. This means that countries need establishment of a common (unique) path for comparison between the achievements and requirements (what we have vs. what we need);
- Tool needs to be pretty comprehensive, in order to be able to match any descriptors and different kind of levels;
- Should be a combination of factual information, professional judgements and supporting evidence;
- Has to produce uniform format (for example, report) which will not require any alterations in terms of regional, national or local arrangements (enabling not regulatory) and will be easy to read.

The tool should combine all the data that one study program offers, in terms of learning outcomes, general and specific, together with the gradation system or more general, levels of achievements specific to the countries, into concept that will offer unique way of awarding the learner with a report that will clearly show the quality and quantity of the learned and gained through the learning process, which will be base for further recognition. Since different countries still deals with a tremendously big set of different terms and levels describing the "skillset", there is a need of a translation system (black box) that will give the answer about the quality and quantity of the learner being subject of recognition process.

For this purpose, several broad fields needs to me examined in order of creating convergence between the data specific for each field, regarding the need of recognition:

- National qualification frameworks;
- Regional qualification frameworks;
- Sectoral qualification frameworks;
- Competence frameworks;
- Job evaluation systems;
- Job specifications;
- Program entry requirements.

As a result, this system should translate any descriptors (learning outcomes) into internationally recognized form. This is in parallel with the global growth regarding the need to be able to measure everything, such as the kinds and levels of achievement. It should be able to work with any outcome-based structure (qualification, credential, study program, job specification or even framework level). The system should translate them into an internationally recognized form of description which can be used to compare achievements and/or requirements.

UNESCO has developed solid starting system regarding this issue, named World Reference levels (WRLs). The WRL Tool is designed to work with any outcomes-based qualification, credential, set of entry requirements, job specification or framework level. It translates them into an internationally recognized form of description which can be used to compare achievements and/or requirements. It is consisted of:

- 11 (eleven) different ways of describing achievement, which are elements of capability
  - Accountabilities:
    - Activities;
    - Responsibilities;
    - Working with others;
    - Quality;
  - Capacities:
    - Skills and procedures;
    - Communication;
    - Data;
    - Knowledge and know-how;
  - Contingencies:
    - Context;
    - Problems and issues;
    - Values.
- 8 (eight) different levels of describing the stage of progression, regarding each element of capability (A1 – D2).

The system deals with 51 (fifty-one) different indicators of progression.

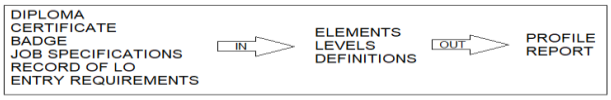

Figure 2. WRL conversing LO inputs in WRL outputs

The WRL tool is created to:

- Support owners and users to describe credentials, job specifications or entry requirements in a common language.
- Produce a WRL Profile based on the WRL Elements of Capacity and Stages of Progression for any achievements or requirements.

- Produce a WRL Report giving vital information on any quality assured credential.
- Combine factual information, professional judgements & supporting evidence.
- Use a standardized way of representing outcomes without changing them

A. *WRL application to a specific study program*

Subject of profiling in this paper is the accreditation elaborate for the study program of Business Economy at the Faculty of Economy, 2020, Goce Delcev University in Stip, Republic of North Macedonia. Title gained through this study program is BACHELOR OF ECONOMIC SCIENCE IN THE AREA OF BUSINESS ECONOMICS VI A (NQF). Documents that are considered to be important for this work are the main elaborate book of the study program and the additional common study programs book, containing the necessary information about the knowledges, skills, competences and values that students are supposed to gain through the study program and all the courses passed. The part of the documents containing this issue is well examined and translated into the terminology used into the WRL tool. In tis context, all the steps are followed in creating the final WRL report and profile – documents that are crucial in the process of recognition of knowledge, skills and competences.

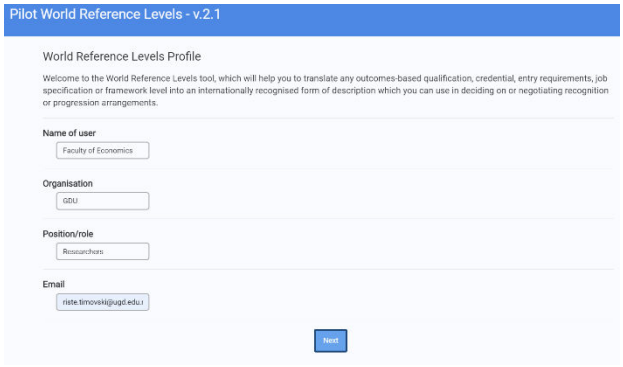

Figure 3. Creating profile in WRL

Three of the overall eleven elements of capability were examined in this research (one of each of the three general fields of capability that WRL deals with):

- Accountabilities:
  - Activities;
- Capacities:
  - Communication;
- Contingencies:
  - Problems and issues;

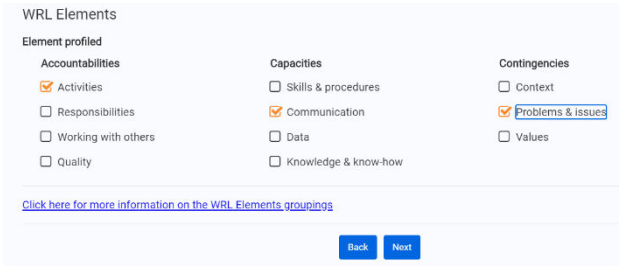

Figure 4. Choosing elements of capability for examining

Precise translation of the skills, competences and knowledges section from the documents available is done into the terminology used by the WRL tool, in order of answering all of the questions in the application. After selection of the elements regarding the subject, for each element the user will have to provide answer to a specific series of questions, each of which is accompanied by a list of possible answers. Many of the terms in the options are linked to a WRL definition in the WRL directory. The appropriate answers should be selected by the user (one or more). The possible answers contain one or more of 51 terms which indicate changes of technical difficulty, scope or autonomy. After this process, the tool generated level description and information about all of the three capability fields, describing the level and the skillset gained at that level to the study program. All the stage choices generated with the tool are shown at figure 5:

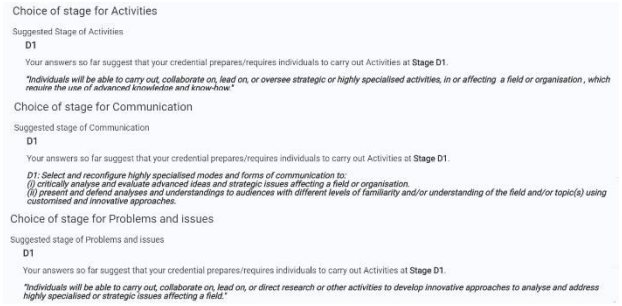

Figure 5: General WRL descriptors

At the end, we generated the final picture (profile and report) of the system. The final report is as shown in the following figure, containing the stage of progress of every different element chosen to represent the subject of profiling.

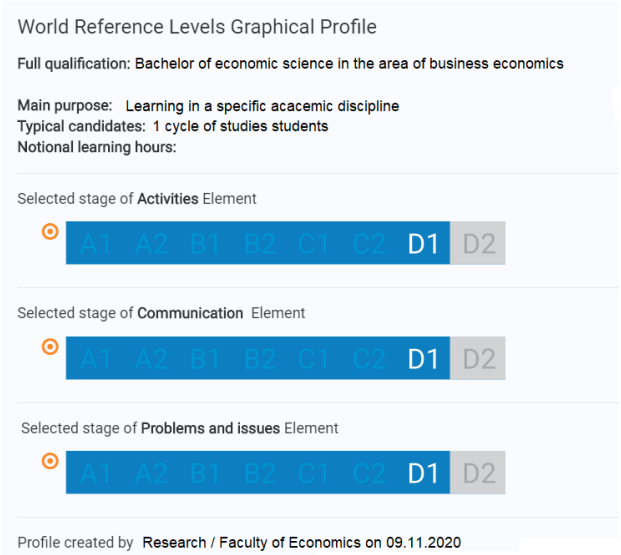

Figure 6. Final report

It is clear from the report that all three descriptors are at level D1, with appropriate explanation for each of them. Sure, the application offers possibility to choose from the neighbor levels of progression if found more close to the reality.

IV. CONCLUSIONS AND RECOMMENDATIONS

Conducted analysis on the use of learning outcomes in the process of recognition indicate that states/institutions use generic learning outcomes (more), but not specific learning outcomes. We have to note that this is also situation in our work here, but is directly corelated with the structure of the official documents we had do examine. However, the issue of how the learning outcomes of qualifications are used in recognition should be explored in more detail. Therefore, several challenges are identified as regards the use of learning outcomes in recognition, e.g., poorly articulated learning outcomes are subject to interpretation, variety in terminology and phrasing (including the issues of translation of learning outcomes), as well as lack of trustful sources of learning outcomes.

The following recommendations about learning outcomes are provided:

- The structure, formulation of learning outcomes should be improved by creating common guidelines on how higher education institutions (HEIs) should write learning outcomes in relation to the recognition practice. The content of the learning outcomes (topics, themes) would remain at the discretion of each provider.
- The availability of learning outcomes and its sources should be at a high level (and their translation into a commonly language).
- Permanent update relevant institutions and HEIs about the relevance and importance of learning outcomes of qualifications to ensure comparability and recognition of qualifications.
- Permanent level descriptors of NQFs.
- Regular trainings and methodological guidance for credential evaluators about learning outcomes and their use in recognition should be provide.
- Implementing and presenting standardized learning outcome analysis methods and tools to relevant institutions included in the recognition process for their use of analyzing the learning outcomes in recognition.

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