SELF-CERTIFICATION REPORT

OF THE NATIONAL QUALIFICATIONS FRAMEWORK FOR HIGHER EDUCATION

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NATIONAL COHESION STRATEGY

European Qualifications Framework

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Editor:
Prof. Zbigniew Marciniak, Ph.D., Warsaw University

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Authors:
Prof. Zbigniew Marciniak, Ph.D., Warsaw University
Prof. Ewa Chmielecka, Ph.D., Warsaw School of Economics
Prof. Andrzej Kraśniewski, D.Eng.
Ph.D. Tomasz Saryusz-Wolski

Consultants:
Agnieszka Chłoń-Domińczak, Ph.D.
Horacy Dębowski
Stanisław Sławiński, Ph.D.
Jolanta Urbanik

Translation from Polish:
Barbara Przybylska

Cover page and illustrations:
Marcin Niwicz

PUBLISHER
Instytut Badań Edukacyjnych / Educational Research Institute
ul. Górczewska 8
01-180 Warszawa, Poland
tel.+ (48 22) 241 71 00
www.ibe.edu.pl

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Part 1. Qualifications awarded in the Polish higher education system and their quality assurance – the status before the introduction of the National Qualifications Framework for Higher Education (NQF-HE)

The system of higher education in Poland is regulated by the Act – Law on Higher Education of 27 July 2005.[1] According to this act, higher education is provided by public or private institutions established for this purpose in the manner prescribed by law.

Higher education in Poland is organised as follows: first cycle, second cycle, long cycle master's degree studies, doctoral studies, and postgraduate studies. This stage of education leads to one of the following diplomas:

1. Studies corresponding to the Bologna first cycle:
   - a diploma certifying the professional title of licentiate (*licencjat*),
   - a diploma certifying the professional title of engineer (*inżynier*),
   - a diploma certifying a professional title equivalent to licentiate or engineer (for example, engineer in fire prevention, licentiate in midwifery).
2. Studies corresponding to the Bologna second cycle:
   - a diploma certifying the professional title of master (*magister*),
   - a diploma certifying the professional title of master engineer (*magister inżynier*),
   - a diploma certifying a professional title equivalent to master (for example, the title of physician).
3. Doctoral studies (upon fulfilling the conditions prescribed by law):
   - a diploma certifying the title of doctor in a specific academic discipline or doctor of arts in a specific discipline of the fine arts. The possession of a master, master engineer or equivalent degree is required in order to apply for a doctoral degree.
4. Certificates of completion certify the completion of postgraduate studies.

External supervision of quality assurance in higher education is performed by the Polish Accreditation Committee (PAC). As of January 23, 2009, PAC is a member of the European Association for Quality Assurance in Higher Education (ENQA), and as of April 5, 2009, was entered into the European Register of Quality Assurance Agencies (EQAR). The PAC is also a member of the European Consortium for Accreditation (ECA), the Central and Eastern European Network of Quality Assurance Agencies in Higher Education (CEENQA) as well as the International Network of Quality Assurance Agencies in Higher Education (INQAAHE).

The PAC carries out its activities in accordance with the "Standards and guidelines for quality assurance in the European Higher Education Area" (ENQA, 2005).

In addition, according to the information provided on June 26, 2012 by the U.S. Secretary of Education, the standards and procedures used by the Polish Accreditation Committee for the accreditation of medical schools have been recognised by the National Committee on Foreign Medical Education and Accreditation (NCFMEA) as comparable to counterpart standards in the United States. This decision means that U.S. students can apply to the William D. Ford Federal Direct Loan program for the funding of studies taking place in Polish medical schools. A re-assessment of existing accreditation standards and procedures is scheduled for 2017.[2]

Polish higher education institutions are also able to obtain academic community accreditation from commissions active in specific areas of learning, such as the University Accreditation Commission, the Accreditation Commissions for Technical, Economic, Fine Arts Higher Education Institutions operating under the auspices of the Conference of Rectors of Academic Schools in Poland (CRASP). These

[1] Act of 27 July 2005 on the Law on higher education (Journal of Laws 2012, No. 572, with later amendments).

[2] http://www.pka.edu.pl

commissions assess the quality of programmes and fields of study. In order to apply for accreditation from these commissions, an institution must have an internal system and procedures for stimulating and assessing teaching and learning quality, and have a credit transfer and accumulation system compatible with the ECTS.

Part 2. Expectations related to the introduction of the National Qualifications Framework

2.1. The National Qualifications Framework for Higher Education: a method for describing the higher education system or an instrument of its reform?

Systemic transformation has brought Poland many profound changes, also in education. In particular, Polish society has undergone a dramatic increase in achieving education at higher levels. At the beginning of the 1990s, the number of students in Polish universities was about 400,000; only about 10% of the most talented youth completing upper secondary school were admitted to university each year. Today, over half of each year's upper secondary school graduating class enrols in higher education studies, with the number of students now reaching almost 2 million, a nearly five-fold increase.

For many decades, education in Polish higher education institutions was considered elitist. Extremely selective recruitment mechanisms provided a fairly homogeneously talented group of incoming students, whose intellectual potential allowed education to be conducted in such a way, so that at the end of study, students understood the main tenets of research conducted in their relevant fields of study, technology or art. This was the chief orientation of the educational process in most fields of study. This process was implemented similarly in all universities offering the same study programme, which over time became reflected in the state educational standards outlining this process.

The massification of higher education has created an urgent need to shift the system in Poland from a purely elitist model to a model of diversified learning, taking into account to a much greater degree the diversity in the level of students' abilities, as well as in their interests and goals in life. While some students undoubtedly are still interested and capable of pursuing and participating in more research-oriented studies, the vast majority are seeking an education that offers a solid base and is flexible, enabling them to perform a variety of jobs and different social roles. A centrally standardised education system (rigid, centrally determined list of academic disciplines with centrally established standards of education for each study programme) was not able to meet such diverse needs.

Additionally, as a result of the significantly greater differentiation in students' abilities than previously, it could no longer be safely assumed that the conscientious implementation of an adequate and nationally uniform curriculum for a given academic discipline would automatically guarantee a satisfactory level of knowledge and skills among graduates. Given this situation, the focus had to shift from the educational process itself to achieving learning outcomes as a result of this process so that the mission of higher education could be properly fulfilled.

The paradigm offered by the context of the European Qualifications Framework (EQF) is ideally suited to these needs. Establishing the National Qualifications Framework for Higher Education (NQF-HE, NQF for Higher Education) requires focussing on learning outcomes as a uniform tool for describing the learning process. It provides a clear way of relating the results of tertiary education at one higher education institution to others, as well as to outcomes attainable in other forms and institutions, even foreign ones. In addition, shifting the focus from the educational process to its outcomes means that the guarantor of a quality education ceases to be a state-controlled, standardised program, and becomes instead the comparison of intended learning outcomes with those verified as actually having been attained by students at a given higher education institution. Consequently, we are now able to move away from a centrally controlled educational process for specific study programmes and provide universities the right to autonomously develop this process in ways that are most efficient and adapted to the capabilities, needs and interests of enrolled students.

Additionally, the basis of assessing the quality of education becomes not the verification of compliance with state core teaching programme requirements, but the credibility of the university's comparative analysis of intended and achieved outcomes and the conclusions drawn to improve future results. On

one hand, this approach gives the school much creative freedom in developing the learning process, while on the other, it requires the transparent accountability of the promises made to young people admitted to study programmes. Increased freedom of action and clear rules of accountability will surely unleash the genuine potential of universities to improve their educational offer.
Because the proper implementation of the National Qualifications Framework for Higher Education promotes the diversification of educational programmes and requires a high degree of quality assurance for such diverse programmes, the NQF has become an ideal tool for adapting the Polish higher education system to a changed reality.

2.2. Particular expectations resulting from historical and social contexts

Given the legacy of the recent past, the creation and development of civil society, in addition to economic development, is of utmost importance in Poland. Within this context, all of Polish society is a stakeholder of the National Qualifications Framework (Polish Qualifications Framework and the National Qualifications Framework for Higher Education, NQF), as it successfully transforms into a society organised according to the principles of a developed democracy created on the basis of civil society.
The persons working on the National Qualifications Framework for Higher Education, as well as the simultaneously developed Polish Qualifications Framework (PQF) recognised this context as one of the key priorities. During this work, European documents related to qualifications frameworks were also taken into account, especially the *Recommendation of the European Parliament and of the Council of 18 December 2006 on key competences for lifelong learning*.[3] This document presents social and civic competences among the eight competences described. Social competences include the ability to communicate in different social environments and to display tolerance when facing different opinions and points of view. Civic competence includes knowledge of contemporary events in national, European and world history. Having these competences allows for the effective and constructive participation in social, professional and civic life. The European Qualifications Framework's category of "competence" describes learners' competences within the areas of responsibility and autonomy, signifying the proven ability to use knowledge, skills, as well as to apply personal, social and methodological abilities at work or school and in professional and personal life. Descriptors[4] (known as the Dublin Descriptors) of the Bologna Framework state that these competences must also relate to important ethical and social issues, including the ability to formulate judgments and assume responsibility for one's judgments. All of these guidelines have inspired the authors of the PQF and persons working on the descriptions of social competence for higher education's eight broad areas of study.
In the National Qualifications Framework for Higher Education (as well as in the PQF), competences are described by the key categories of "identity", "cooperation", "responsibility", with the explicit intent of preparing learners to responsibly assume social roles according to the principles of participation in a developed civil society. The inclusion of these competences in the qualifications frameworks requires educational programme developers to design sets of corresponding learning outcomes to reflect them. This important task requires special attention in a post-communist country, where describing learning outcomes must be undertaken with care to avoid any associations with lingering memories of decades of ideological indoctrination.

[3] Recommendation of the European Parliament and of the Council of 18 December 2006 on key competences for lifelong learning (OJ C 111, 6.5.2008, pp. 11–18).

[4] In this report, the term descriptors, appearing in such documents as the Recommendation of the European Parliament and of the Council of 18 December 2006 on key competences for lifelong learning, is translated into Polish as "charakterystyka poziomu kwalifikacji" [the characteristics of a qualification level]. The term descriptor is translated as „składnik opisu poziomu kwalifikacji" [a component of the description of a qualification level].

2.3. The expectations of the labour market and employers of the learning and qualifications attained in higher education

Polish employers expect graduates' competences to better match the requirements of the work performed in specific occupations. This especially includes increased expectations for job candidates to be able to quickly adapt to new tasks that often exceed a traditional understanding of the occupation.
Research conducted as part of *The Study of Human Capital in Poland* project in 2012 (Dawid-Sawicka et. al, 2012) shows that professional competences dominate among the types of competences sought out in young employees, as indicated by almost 2/5 of employer respondents. Next on the list are "soft" skills, such as maintaining relations with people and clients, communication, personal culture and self-presentation skills. No less important are the traits that complement professional competences, which guarantee the right quality of the work performed, such as: responsibility, discipline, integrity, reliability, diligence, as well as care, precision, and attention to detail. Employers also highly value flexibility in young employees. The "top ten" competences required of young people are not that different from those required of all workers, aside from a few features. More is expected of them in the areas of: personal culture, politeness, self-presentation and personal image, initiative, ingenuity, creative thinking, finding new solutions and punctuality.
Particular attention is paid to the following competences:

- fluency in foreign languages – most employers complain of the low language skills of current graduates,
- the ability of graduates to learn autonomously and adapt to new professional tasks,
- general competences of graduates not directly related to their field of study – mentioned here are communication skills, teamwork, problem solving and creativity,
- social competences, with an emphasis on the greater difficulty in compensating for the lack of social competences compared to strictly professional ones.

All these competences are included in the National Qualifications Framework for Higher Education as essential elements of the learning outcomes for each programme, regardless of the area of education represented by the programme.

Part 3. Work on developing and implementing the National Qualifications Framework for Higher Education

3.1. The course of work on the National Qualifications Framework for Higher Education

The typical scenario for designing and implementing a national qualifications framework for higher education[5] is comprised of the following steps:

I. The national authority responsible for higher education decides to begin work on the framework.
II. The national authority responsible for higher education defines the objectives of the National Qualifications Framework.
III. Organisational work: establishing work teams that will design, assess and initiate implementation of the National Qualifications Framework. Identification of stakeholders.
IV. Project work (national level: central and intercollegiate) – the project should define, among others, the structure of the levels (cycles and intermediate levels), level descriptors (learning outcomes), educational profiles and the process of assigning ECTS credits.
V. Consultations: national discussion on the project involving all stakeholders.
VI. Project approval and issuance of legislation to implement the National Qualifications Framework by the authority responsible for higher education.
VII. Administrative authorisation – the division of tasks to implement the framework. Defining the roles of higher education institutions (HEI), national accreditation agencies and other bodies.
VIII. Implementation of the National Qualifications Framework at the institutional/programme level – higher education institutions define study programmes through the use of learning outcomes.
IX. Verification of implementation, supplementing and amending – among other means, through the use of accreditation procedures.
X. Self-certification of the compatibility between national frameworks and the premises of the frameworks for higher education for the European Higher Education Area (EHEA).
XI. Development of information technology (IT) tools to ensure the transparency of information on the qualifications framework for higher education in a particular country.

The scenario presented above was implemented to develop the National Qualifications Framework for Higher Education in Poland in the manner described in the following sections.

I. The decision to begin work

In November 2006, the minister responsible for higher education appointed the Working Group for the NQF for Higher Education, assigning it the task of preparing an initial model of the framework. Developing the NQF-HE was the first and, in a sense, pilot phase of a larger project – the development of the National Qualifications Framework for lifelong learning (Polish Qualifications Framework). In October 2008, the Minister of Education appointed a team of experts for the National Qualifications Framework for Lifelong Learning, recommending the preparation of a draft, comprehensive model of a Polish qualifications framework. This was the first stage of work on the Polish Qualifications Framework. The team included a group of experts from the higher education sector – mainly members of the Working Group for the NQF for Higher Education.
In 2010, work began on the second stage of the PQF's design and implementation. This is currently being conducted at the Educational Research Institute (IBE) by a team that includes experts from the higher education sector, with the participation of a wide range of external stakeholders.

[5] Based on the recommendations in the publications of the Bologna Working Group on Qualifications Frameworks (2006) accompanying the Bergen Communiqué and later supplements.

II. Defining objectives

The first objectives of the NQF for Higher Education were included in a report of the Working Group in the spring of 2007, and approved by the Ministry of Science and Higher Education as the basis for further work. These objectives were expanded and redefined in the course of further work on the NQF-HE. Since the appointment of a working group of experts for the Polish Qualifications Framework, these objectives have been defined jointly for both frameworks.

III. Organisational work

The composition of expert bodies working on the qualifications framework for higher education in the early design stage included primarily internal stakeholders of the higher education system. The broad inclusion of external stakeholders occurred in the consultation phase of the first and second stages of work on the Polish Qualifications Framework project (see the Polish referencing report).
On July 28, 2010, the National Coordination Point for the National Qualifications Framework was established at the Bureau for Academic Recognition and International Exchange, and assigned two tasks:

– to provide access to information and advice on the relationship between the national qualifications system and the European Qualifications Framework for lifelong learning,
– to encourage the participation of stakeholders, institutions of higher education and vocational education and training, social partners, various sectors of the economy, and experts in the effort to compare and use qualifications at the European level.[6]

On February 17, 2010, the Prime Minister established[7] the Inter-ministerial Taskforce for Lifelong Learning. In order to perform the tasks of monitoring the development and implementation of the National Qualifications Framework, a sub-group was created: the Steering Committee for the National Qualifications Framework for Lifelong Learning, chaired by the Minister of Science and Higher Education. The Committee consists of representatives delegated by the Minister of Science and Higher Education, Minister of National Education, Minister of Economy, Minister of Labour and Social Policy, Minister of Regional Development, Minister of Foreign Affairs, Minister of Culture and National Heritage, Minister of Health, Minister of National Defence, Minister of Internal Affairs, Minister of Transporation, Construction and Maritime Economy and Minister of Sports and Tourism.

IV. Work on the project

The work designing the National Qualifications Framework for Higher Education was conducted from 2006–2011 and resulted in three successive reports submitted by the Working Group on the main form of the framework and how it will be implemented for EQF levels 6–8, or 1–3 of the EHEA cycle. These reports were subsequently approved by the Ministry of Science and Higher Education as the basis for further work. In 2009, the Minister of Science and Higher Education appointed the next team of experts of about 80 persons, whose task was to develop descriptors for the eight broad areas of study with the use of learning outcomes, taking into consideration the qualifications levels awarded in higher education. Work on these descriptors was completed in the spring of 2010. They became the basis for the work in the spring of 2011 of developing about 40 sample study programmes described with the use of learning outcomes and adapted to level 6–8 descriptors, as well as to the descriptors for the broad areas of study. Experts working in this team were also active participants in the process of preparing suitable legislation amending the *Act on Higher Education* and implementing the solutions developed, such as the educational profiles, the methodology of assigning ECTS credits, etc.

[6] Statute of the Bureau for Academic Recognition and International Exchange; annex to Administrative order No. 37/2010 of the Minister of Science and Higher Education amending the administrative order on establishing the Office for Academic Recognition and International Exchange (Journal of Laws, Ministry of Science and Higher Education 2010, No. 4, item 68).

[7] Administrative order of the Prime Minister of 17 February 2010 on the Inter-ministerial Taskforce for Lifelong Learning, including the National Qualifications Framework, issued on the basis of art.12 of the Act of 8 August 1996 on the Council of Ministers (Journal of Laws 2003, No. 24, item 199 with later amendments).

V. Consultations

2009 saw the launch of an unprecedented scope of consultations mainly with the academic community. Its purpose was to prepare higher education institutions for the upcoming changes in the design and teaching of study programmes. The National Team of Bologna Experts made the NQF-HE the main theme of its seminars and conferences from 2009 to 2011. It is estimated that about 160 meetings took place in those years (professional community conferences, seminars and other forms of consultation) of previously trained Bologna Experts with academicians, students, institutions involved in higher education (Rectors Conferences, Polish Accreditation Committee, General Council, Students' Parliament of the Republic of Poland), associations, trade unions, employers' associations and others. The meetings provided the academic community and external stakeholders with basic knowledge about the National Qualifications Framework and the opportunity to discuss solutions and emerging problems.

At the same time, from 2010, similar activities were initiated by the Ministry of Science and Higher Education, which organised about 80 meetings. The conclusions from these meetings served as the basis to improve the executive legal regulations being prepared.

The discussions at these meetings focused on two books published by the Ministry of Science and Higher Education (6000 copies), distributed free of charge in the autumns of 2010 and 2011, namely:

- E. Chmielecka (ed.), „Autonomia programowa uczelni – ramy kwalifikacji dla szkolnictwa wyższego" ["Programmatic autonomy of higher education institutions – qualifications frameworks for higher education"], ISBN 978-83-921765-5-8.
- A. Kraśniewski, „Jak przygotowywać programy kształcenia zgodnie z wymaganiami Krajowych Ram Kwalifikacji dla Szkolnictwa Wyższego?" ["How to prepare study programmes according to the requirements of the National Qualifications Framework for Higher Education?"], ISBN 978-83-63277-00-0.

The comments gathered during these meetings were submitted to the expert groups working on the broad areas of study descriptors and sample study programmes.

VI. Approving the design, issuing legal acts

The next stages of developing the concept of the National Qualifications Framework for Higher Education were analysed, and then accepted by the NQF Steering Committee.

The prepared and consulted concept of the National Qualifications Framework for Higher Education became the basis for amending the Act – Law on Higher Education, introduced with the Act of 18 March 2011 on amendments to the Act – Law on Higher Education, the law on academic degrees and titles and on degrees and titles in the arts and on amendments to certain other laws.[8] In accordance with the Polish legislative process, the proposed provisions of the Act were subject to public consultation, and then were sent for further work to the Subcommittee on Higher Education of the Parliamentary Committee for Education, Science and Youth (November 2010–January 2011).

The Act is accompanied by a set of regulations on the implementation of various elements of the National Qualifications Framework, issued under its delegation.

Throughout the entire time, seminars continued to be held to inform about the assumptions of the NQF-HE resulting from the amended Act – Law on Higher Education of March 2011, and the regulations that came into force after the passage of the law (autumn of 2011). It can be concluded that they were held in all the academic centres of Poland and were targeted to all types of schools – regardless of profile or status.

From January 2012, the Ministry of Science and Higher Education began to organise meetings known as "reverse seminars" – their idea is to provide universities with expert assistance in designing study programmes according to the new principles.

[8] Act of 18 March 2011 on amendments to – the Act on Higher Education, the law on academic degrees and titles and on degrees and titles in the arts and on amendments to certain other laws (Journal of Laws 2011, No. 84, item 455 with later amendments).

In the summer of 2012, the Ministry of Science and Higher Education announced a competition for the best new programmes developed according to the NQF-HE regulations, allowing universities to obtain substantial additional funding to introduce changes. Persons involved in developing the frameworks were invited to participate in the jury to decide the winners of the competition, which was concluded in mid-November 2012.

VII. Administrative authorisation

The division of roles in the implementation process and operation of the National Qualifications Framework for Higher Education is defined in the amended Act – Law on Higher Education and issued on the basis of regulations.

The Ministry of Science and Higher Education maintains a register of qualifications awarded in the higher education system and in its monitoring function, oversees their quality. It does this through the Polish Accreditation Committee (PAC). Under current law, the minister responsible for higher education may, upon receiving information indicating a problem, request the Committee to conduct an unscheduled quality assessment of the educational process at an institution. In the case of a negative assessment of the quality of education, the law requires the Minister to suspend or terminate the negatively assessed fields of study.

The Polish Accreditation Committee, as an independent agency, bases its work on a statute and the resolutions of its Presidium. After enactment of the law implementing the National Qualifications Framework for Higher Education, the PAC made appropriate changes to its statute on November 10, 2011. The resolution on guidelines for preparing self-assessment reports by higher education institutions was also changed (January 26, 2012). In addition, PAC issued new guidelines on accrediting programmes[9] and institutions,[10] which incorporated the content of the amended Act and its regulations. Standards and criteria of quality assurance require higher education institutions to describe study programmes by using learning outcomes and to use appropriate validation methods.

The role of universities in implementing the National Qualifications Framework for Higher Education is defined by the Act and its relevant regulations. On one hand, these provisions extensively broadened the autonomy of higher education institutions in developing and conducting the educational process. On the other hand, they imposed the requirement of developing clear descriptions of intended learning outcomes and of systematically implementing a quality assurance system that analyses educational effectiveness in relationship to these descriptions. The reliable results of these analyses presented by higher education institutions will be the core of the process assessing the quality of education conducted by external entities, including the PAC.

VIII. Implementation at the institution/programme level

The amended Act – Law on Higher Education and its accompanying regulations (as well as the PAC accreditation standards) require higher education institutions to develop study programmes according to the principles of the NQF-HE in the 2011/12 academic year. University senates were obliged by law to approve these programmes in the spring of 2012, and this took place. Most higher education institutions appointed taskforces and issued instructions to help the developers of specific programmes. All study programmes at higher education institutions that admitted students for the 2012/13 academic year are described with the use of learning outcomes and are referenced to NQF level descriptors (see 3.7.2).

[9] Resolution no. 961/2011 of the Presidium of the Polish Accreditation Committee of 24 November 2011 on the principles of conducting a site visit during a programme assessment.

[10] Resolution no. 962/2011 of the Presidium of the Polish Accreditation Committee of 24 November 2011 on the principles of conducting site visits during an institutional assessment.

IX. Verifying implementation

In the autumn of 2012, the Minister of Science and Higher Education established a team to monitor implementation of the amended Act, which specifically seeks input on the new regulations and develops recommendations for their improvement. The team consists of representatives of the academic community (rectors' conferences, Council for Science and Higher Education) and experts.
Also, after a first round of accreditation, during which the new study programmes prepared by higher education institutions were assessed, the Polish Accreditation Committee sent the team a set of recommendations and revisions of the existing legislation. PAC also planned to adjust the quality assessment tools used as a result of the experiences gained during this process in the autumn of 2012. It is expected that work on harmonising the quality assurance system with the qualifications framework will be an ongoing process.

X. Self-certification

Confirmation of consistency between the qualifications framework and the EHEA guidelines for qualifications frameworks is presented in two ways:
- in this Self-certification Report, which contains an analysis of the consistency of NQF-HE level descriptors in reference to the EQF, as well as to the Qualifications Framework for the European Higher Education Area (QF EHEA),
- in the general PQF/EQF referencing report, which also includes the area of higher education.

XI. Transparency of information

Implementation of the PQF involves establishing a National Qualifications Register and a portal providing complete and universally available information on the qualifications system in Poland. Higher education will be fully included in both these components of the system.
Today there is already a tab on the homepage of the Ministry of Science and Higher Education with updates on the National Qualifications Framework for Higher Education. The Public Information Bulletin page at the Ministry's site includes the set of legal acts governing its implementation. In addition, higher education institutions are required to include not only a description of the educational process (plans of the studies), but also the intended learning outcomes on their websites.

3.2. Cooperation with external stakeholders, especially representatives of the labour market, quality assurance institutions and others listed in the referencing criteria

The concept of the National Qualifications Framework for Higher Education was the subject of discussions in the academic community and with higher education stakeholders practically from the moment the Bologna process was implemented, which occurred with the adoption of the Act – Law on Higher Education in July 2005. Even then, it was clear that the newly introduced regulations changing the old system of (usually) five-year studies to a first and second cycle system will not meet their objectives without adequately revising the educational process.
The postulate of the academic community to finalise implementation of the Bologna process by working on the National Qualifications Framework was reflected in the higher education development strategy project, developed by the Conference of Rectors of Academic Schools in Poland, and – independently – in a strategy designed by experts commissioned by the Ministry of Science and Higher Education, carried out by Ernst & Young. Both projects were widely consulted, also with Polish higher education stakeholders.

Extensive consultations also took place during the stage of amending the Act – Law on Higher Education[11] due to the nature of this process. In particular, representatives of the many groups interested in the effects of future changes on Polish higher education institutions were continuously and actively involved over several months of work by the Parliamentary Sub-Committee on Higher Education. During this phase, the consultation process improved many specific clauses benefitting the future process of implementing changes. Meetings were also held with labour market representatives during the consultation process described in Part 3.1.V.

Finally, a series of public debate meetings are being held during the third stage of work now underway on the Polish Qualifications Framework for lifelong learning. These have taken place on average once a month and are addressed to various stakeholder groups, but they are open to any interested person. The Educational Research Institute, which is preparing the draft of the framework, is the organiser of this debate. The Polish Qualifications Framework for Higher Education, presented in this report, is an integral part of the broader project, and its description will be found verbatim therein will be found verbatim therein. In the first stage of work on the preliminary PQF model, expert group members were representatives of employers; the second stage carried out by the Educational Research Institute includes, among others, research on the sectors involved in the functioning of qualifications in the labour market.

In addition, as described in Part 3.1. of this report, the Steering Committee on the National Qualifications Framework is composed of high level representatives from 11 ministries who have a great understanding of the conditions of their areas of interest, as well as the opinions of major stakeholder groups.

3.3. Cooperation with the formal general and vocational education sectors

The conceptual work related to the development of the National Qualifications Framework for Higher Education has been conducted since 2007 in close coordination with the work on describing the qualifications available from the education system, which is the foundation for higher education. In particular, care was taken to ensure that the team of experts developing the National Qualifications Framework worked to a large degree together with the team of experts for the NQF-HE.

The main task related to the formal general education system was clearly defining its learning outcomes. This was also a key issue for developing the qualifications for higher education – the definitions of these qualifications must be related to the foundation of knowledge, skills and attitudes which upper secondary school graduates will possess when they cross the threshold of the university.

The legal act containing the description of the learning outcomes in the formal general education system is the resolution of the Minister of National Education entitled *Core curriculum of general education*.[12] This regulation defines the learning outcomes for various stages of education in the formal general education system. It does this at two stages of genericness. The higher stage includes what are known as general requirements specified for each subject. This is a set of a number of core competences, attained by completing a subject course. For example, mathematics includes strategic thinking, modelling, reasoning and argumentation. The lower stage, known as specific requirements, describes the scope of the educational content. Gaining competences defined by the specific requirements should be implemented by schools in such a way as to primarily develop pupils' more general competences as defined in the general requirements.

The core curriculum of formal general education is the only document regulating the content of national examinations, which students take in the formal general education system below higher education. In particular, it defines the scope of the *matura* examination, which – apart from special

[11] Based on the Act of 18 March 2011 on amendments to – the Act on Higher Education, the law on academic degrees and titles and on degrees and titles in the arts and on amendments to certain other laws (Journal of Laws 2011, No. 84, item 455 with later amendments).

[12] Resolution of the Minister of National Education of 27 August 2012 on the core curriculum for pre-school child development and general education in specific types of schools, (Journal of Laws 2012, item 977).

skills tests (physical fitness or art skills) required for a small number of study programmes – is the only recruitment tool for higher education. The mandatory subjects tested by the *matura* examination are the same for all pupils in Poland and consist of written and oral exams in the Polish language, written and oral exams in a selected modern foreign language and a written exam in mathematics. To pass the *matura*, which is required for admission to a higher education institution, an appropriate number of points must be scored from each of these exams. Additionally, pupils may take *matura* examinations in up to six additional subjects chosen in response to the recruitment requirements of the higher education institution that a pupil wants to attend. Higher education institutions define their recruitment needs 1½ years prior to the date of recruitment, which allows pupils to make the best choice of subjects to be tested in when taking the *matura* examination.

In this transparent way, the foundation of formal general education was clearly defined, enabling it to be referenced to the educational process in higher education, as well as to the description of learning outcomes that are intended to be achieved.

Vocational education in Polish schools has a general component that is regulated by the above-mentioned resolution, as well as vocational components. The latter are modular and defined by learning outcomes in the areas of knowledge, skills and social competences. The modules are designed in such a way so that several of them together can comprise an occupational competence. In particular, it is possible to supplement one's education in the lifelong learning system with new modules, which notably expand the potential resources available to perform an occupation. It must be stressed that vocational school pupils in Poland also are required to take general education courses. Even in basic vocational schools, pupils take classes in mathematics and history regardless of their occupational specialisation.

Completing technical upper secondary school offers access to higher education. The courses offered here in general education are based on the same sets of learning outcomes as those required of the formal general upper secondary school. This enables its graduates to take the *matura* examinations and then to apply to a higher education institution. Each year, about 30% of pupils taking the *matura* exam are graduates of technical upper secondary schools.

The PQF level descriptors for the qualifications attained in the formal general and vocational educational systems were developed using the same methodology as for the level descriptors of the National Qualifications Framework for Higher Education. This is due to the belief that the two systems – formal general and vocational education and higher education – are logically and functionally inextricably linked.

3.4. Cooperation with the National Coordination Point and the Steering Committee of the National Qualifications Framework for Lifelong Learning

The Steering Committee convenes as needed – from March 2010 to December 2012 it held nine meetings. During these meetings, information on the progress of work on the National Qualifications Framework and on potential changes to the law are presented. Also, other issues within the Committee's authority are discussed. In March 2010 the Committee recommended that the Bureau for Academic Recognition and International Exchange should function as the National Coordination Point (the Bureau is NCP as of July 2010). In July 2011, the Steering Committee approved the premises of the National Qualifications System. In August 2012, it commissioned the preparation of the Self-certification Report and in December of the same year – it approved the report's first draft.

Representatives of the Coordination Point participated in Steering Committee meetings. They also participated in international events related to qualifications frameworks in Europe and the European Qualifications Framework.

3.5. Internationalising work on the National Qualifications Framework for Higher Education

Designing the qualifications framework for higher education was conducted in collaboration with international experts and centres in the constant presence of European documents and good practices on frameworks. Members of the expert groups were also members of the EQF Advisory Group, Network for National Correspondents for QF EHEA, Bologna Follow-up Group and other international bodies.
During work on the project, expert groups participated in dozens of international meetings in Europe devoted to qualifications frameworks. The annual conference on qualifications frameworks, organised since 2009 in November in Warsaw, has always had one day dedicated to higher education issues, where Polish solutions proposed for qualifications frameworks were also included in the discussions. Study visits for Polish project teams were held in Scotland, Germany, France and Finland. Polish experts participated in the work of the referencing reports of Croatia and Germany. Since its establishment (in 2011), the international team involved in preparing the Polish referencing report for the PQF has been regularly discussing solutions for the higher education framework. In cooperation with the European Commission and the ETF, Polish experiences in designing and implementing the NQF for Higher Education have been presented and discussed at many international fora, also outside of Europe.
It is worth adding that the results of international projects were taken into account (e.g. Tuning), in the work of developing learning outcomes for specific areas of education, as well as existing international agreements related to learning outcomes in certain fields (e.g. engineering studies, music studies, etc.).
The partial results of the work on the National Qualifications Framework for Higher Education were presented to the international community of higher education. These presentations were made in the form of talks at the forum of the European University Association, as well as through articles in specialised international journals (Kraśniewski, 2012b, pp. 19–48).

3.6. Legislative changes enabling the adoption of the National Qualifications Framework for Higher Education

The amendment of the Act – Law on Higher Education of 18 March 2011 introduced a number of important legislative changes to implement the system of the National Qualifications Framework for Higher Education. In particular:

1) The law defines:
   - the first cycle qualification attained through first cycle studies, certified by the professional title of licentiate, engineer or an equivalently defined field of study and educational profile, certified by an appropriate diploma,
   - the second cycle qualification attained through second cycle studies, certified by the professional title of master, master engineer or an equivalently defined field of study and educational profile, certified by an appropriate diploma,
   - third cycle qualification, certified by the doctoral degree,
   - the study programme defined by learning outcomes and a description of the educational process,
   - learning outcomes as resources of knowledge, skills and social competences.
2) The Act authorises the relevant minister for higher education to establish, by resolution:
   - the conditions to be met in descriptions of qualifications,
   - the National Qualifications Framework, including general descriptions of learning outcomes for the broad subject areas of education,
   - the conditions to be met by organisational units of higher education institutions, especially related to the number and qualifications of employees required for study programmes in specific subject areas,

- the conditions to be met by the study programme,
- the conditions of programme and institutional accreditation of higher education institutions,
- the specific conditions for establishing and operating branches and off-site organisational units of higher education institutions.

3) The relevant minister for higher education issued all of the abovementioned resolutions. In particular, a resolution was issued defining the learning outcomes of first and second cycle studies for the general education and practical profiles in eight broad areas of study:
   - humanities,
   - social sciences,
   - exact sciences,
   - life sciences,
   - engineering and technology,
   - medical sciences, health sciences and physical education,
   - agricultural, forestry and veterinary sciences,
   - fine arts.

   These outcomes are very general descriptions of knowledge, skills and social competences, further developing the descriptions in the Qualifications Framework for the EHEA adequately for the specific broad area of study.
4) The law requires higher education institutions to develop descriptions of learning outcomes for all (or newly created) fields of study offered, and to autonomously further develop descriptions of learning outcomes identified by the school for the relevant broad area (or areas) of study.
5) The Act determines that accreditation is performed in relationship to achieved learning outcomes. An objective of the external quality assurance system in higher education is evaluating the quality assurance system functioning in a higher education institution.
6) The Act defines the number of ECTS credits required to obtain first and second cycle qualifications. In order to receive a higher education diploma in Poland, a person must earn:
   - at least 180 ECTS credits for first cycle studies,
   - at least 90 ECTS credits for second cycle studies,
   - for the long cycle master's degree studies – at least 300 ECTS credits in the five-year study system and 360 ECTS credits in the six-year study system.

   A minimum of 60 ECTS credits should be offered to students to be earned for the completion of non-degree post-graduate studies.
7) The Act introduced regulations that meet the needs of the labour market, in particular, the law requires higher education institutions to:
   - adapt education to the needs of the labour market, including, among others, by including representatives of employers in developing curricula and the didactic process, the ability to offer practically profiled studies with the participation of businesses – including business employees in developing study programmes and providing courses for students,
   - monitor the careers of graduates of higher education institutions and to take these results into account in the study programmes,
   - take into account the results of analyses on the consistency of learning outcomes with labour market needs in the process of improving study programmes.

3.7. Activities conducted at the national level and with higher education institutions

Introducing the NQF-HE into higher education institutions included three basic types of activities:

- centrally carried out or coordinated information, training or consulting activities aimed at preparing higher education institutions to introduce the NQF, and then assisting them with its implementation,

– institutional level activities (initiated and coordinated by higher educational institution authorities) related to implementing the NQF,
– activities assessing the effectiveness of introducing the NQF related to programme and institutional assessments carried out by the Polish Accreditation Committee.

3.7.1. Centrally carried out or coordinated activities

Activities targeted to the academic community to promote the idea of introducing a qualifications framework in the higher education system in Poland and to present the concept of qualifications frameworks had already begun during the preliminary work on the NQF-HE project, long before the finalised results were used to prepare the draft legal amendments implementing the NQF-HE. Two main focal points of activity can be distinguished:

1) the work of the National Team of Bologna Experts, coordinated by the Foundation for the Development of the Education System (FRSE).
   With approximately 20 members, the National Team of Bologna Experts (appointed by the minister, approved by the relevant agenda of the European Commission) has been providing information and training activities to the academic community, promoting initiatives related to the Bologna Process and the creation of the European Higher Education Area for many years. Beginning in 2008, the main topic of conferences, seminars and other meetings conducted by members of the team was directing the educational process towards achieving relevant learning outcomes and introducing a qualifications framework, including the process of working on the development of the NQF-HE in Poland.
2) the work on the "Higher Education Development Strategy 2010–2020 – a project of the academic community" (KRASP, 2009).
   The document "The Higher Education Development Strategy 2010–2020 – a project of the academic community", initiated by the Conference of Rectors of Academic Schools in Poland and published in December 2009, named the introduction of the NQF-HE as one of the major projects required to achieve its strategic goals. As a result, during the several months the draft strategy was consulted in the academic community, persons involved in higher education could become familiar with the concept of the NQF-HE and its strategic importance. The scale of these consultations was unprecedented in the history of higher education in Poland (at the initiative of regional conferences of rectors and individual higher education institutions, over 40 presentations and public debates were held in several dozen academic centres).

The next stage of information and training activities coordinated at the central level was carried out in parallel with work on the final version of the NQF-HE project, which was the basis for preparing relevant drafts of legal acts. The general concept of the NQF-HE, as well as the results of teams' work on preparing descriptions of learning outcomes for the broad areas of study, were presented to various fora by members of the Working Group on the NQF and others involved in the teams. These were the topics of discussion at meetings of rectors and vice-rectors representing associations of particular types of higher education institutions, accreditation committees for specific academic communities and at seminars organised by interested universities.

The process of consultations and training implemented by the Ministry of Science and Higher Education under the "National Qualifications Framework for higher education as a tool to improve the quality of education" Project was officially launched on June 1, 2010 at a national conference organised by the Ministry, entitled "National Qualifications Framework for Higher Education – a new tool for learning organisations"; all Vice-Rectors responsible for educational issues participated in this conference.

The scale of activities to inform the academic community and other interested bodies about progress in the work on the NQF-HE and consulting the proposed legislative solutions is unprecedented in the history of higher education in Poland. In the period from October 2010 to February 2011:

– about 40 training – consultation seminars were held (together with workshop activities) in the academic community throughout the country, led by members of the Working Group on the NQF and those team members developing learning outcome descriptions for the broad areas of study of higher education,

- several dozen meetings (seminars, consultations and promotional events) led by Minister Zbigniew Marciniak were held for employers, representatives of local government institutions and organisations, as well as representatives of academic institutions to promote the idea of the NQF-HE in the context of its impact on the socio-economic environment of higher education institutions,
- training materials were developed in the form of a publication entitled "The programmatic autonomy of the higher education institution – qualifications frameworks for higher education" (Chmielecka, 2010); 6000 copies were printed and distributed, among others, to seminar participants and directly to higher education institutions,
- a special website was launched on qualifications frameworks, easily accessible from the Ministry's portal. Basic information about the NQF-HE, schedule of training workshops and consulting and promotional seminars, as well as an electronic version of the above-mentioned publication can be downloaded from this site.

Adjacent to the training and consultations coordinated by the Ministry of Science and Higher Education, extensive work of a similar nature, coordinated by the Foundation for the Development of the Education System, was carried out by the Team of the Bologna Experts. In the 2010/11 academic year, several dozen seminars organised by the Foundation took place. Most often they were combined with workshops held by members of the Team. These experts also organised their own workshops and training activities. Many of the above-mentioned meetings took place in regional centres at the invitation of relatively small higher education institutions – both public and private.

It is estimated that the number of academic teaching and other university staff participating in the various workshops organised during the 2010/11 academic year could reach several thousand persons.[13]

The NQF-HE was formally introduced into the higher education system in Poland with the passage of the law amending the Act – Law on Higher Education of 18 March 2011, and then with the issuance of resolutions on the NQF-HE. Drafts of these regulations were gradually submitted for consultation beginning in April 2011 and their final version was published from August–October 2011. This created the legal basis for the National Qualifications Framework for Higher Education in Poland.

Concluding the legislative process has somewhat changed the nature of training and consulting activities, coordinated by the Foundation for the Development of the Education System. The seminars and workshops held in the 2011/12 academic year were devoted primarily to familiarising the academic community with the new regulations and providing practical guidance on the requirements of higher education institution authorities and specific faculties in the following areas:

- developing appropriate internal regulations defining the principles and procedures for implementing the NQF-HE,
- developing and documenting study programmes in accordance with the requirements of the NQF-HE.

Both the trainers and participants were substantially aided by the publication „Jak przygotowywać programy kształcenia zgodnie z wymaganiami Krajowych Ram Kwalifikacji dla Szkolnictwa Wyższego?" ["How to prepare study programmes according to the requirements of the National Qualifications Framework for Higher Education?"] (Kraśniewski, 2011), commissioned by the Ministry of Science and Higher Education.

In conclusion, it can be said that the legislative and administrative activities undertaken at the central level were accompanied by numerous initiatives activating and supporting academic communities and institutions (mainly higher education institutions), which will be implementing these policy decisions. The process of "mandating change" is thus being carried out together with the process of "managing change".

[13] The final report submitted to the European Commission by the National Team of Bologna Experts at the Foundation for the Development of the Education System for 2009–2011 listed about 200 meetings, attended by over 16 000 participants. Most of these meetings were devoted entirely or in large part to issues related to implementing the NQF (these figures do not include the seminars led by Team members and organised by the Ministry of Science and Higher Education).

3.7.2. Activities conducted at the level of higher education institutions

Activities related to the implementation of the NQF-HE conducted at the institutional level (initiated and coordinated by a higher education institution) include:

- information, training and consultation aimed at the particular academic community,
- preparation and issuance of relevant internal regulations defining the principles and procedures for NQF-HE implementation,
- development and approval of study programmes in accordance with the requirements of the NQF-HE.

Even before the law implementing the NQF-HE was formally enacted, many higher education institutions had already begun to prepare for implementation of the expected, new regulations. These included different activities, such as, feasibility studies, training and information meetings (internal workshops, conducted by invited external experts and the institution's own personnel), modifying and improving the concepts for didactic activities and preparing related documents, including a description of learning outcomes and ways of assessing whether they have been achieved, as well as preparing IT tools to support future programme work. Additionally, some schools also participated in international projects on topics related to study programme development based on appropriately defined learning outcomes. As a result of the initiatives taken ahead of time to adapt to the anticipated regulatory changes, examples of good practice were created, relating in particular to the internal regulations for implementing the NQF-HE and the design of study programmes according to the newly prescribed methods.

The formal introduction of the NQF-HE moved the onus of implementing the National Qualifications Framework to the level of the higher education institution. To some extent, this changed the nature and increased the intensity of the activities conducted by HE institutions. This was required to comply with the provisions of the Act with the start of the 2012/13 academic year, to begin the education process based on different principles than were previously used.

Universities conducted information, training and consultation activities. They were based on a gradual, "cascading" transfer of knowledge and experiences by persons familiar with the issues (including external experts and experts from the higher education institution) successively to unit by unit (faculty) providing the studies, to didactic teams and individual academic teachers. The essence of the reform is that its implementation requires the involvement of the entire academic community – for each course offered, learning outcomes must be defined, ways to determine whether and to what extent they are achieved must be identified and the competences achieved by students must be practically verified.

In view of the large number of tasks associated with the procedure of developing and formally approving study programmes,[14] the following issues were critical to finalise the approval process so that the study programmes could be completed early enough to allow academic staff to prepare for implementing the approved programmes from the start of the 2012/13 academic year. This was especially the case at large universities offering many fields of study:

- determining the appropriate schedule of activities (at the level of the HE institution and faculties),
- developing and issuing timely internal regulations on the rules and procedures for the implementation of the NQF-HE, and especially the mode of work leading to the approval of study programmes together with their content and forms of documentation,
- developing appropriate IT tools to support the preparation of the documentation for the study programme, enabling procedures to be finalised for approving the study programmes early enough to prepare the academic staff to implement them at the beginning of the 2012/13 academic year.

[14] Learning outcomes for all study programmes offered at a higher education institution (by individual faculties or other units) must be adopted by a resolution of its Senate.

Part 4. Presentation of the National Qualifications Framework for Higher Education

4.1. Methodological premises

The National Qualifications Framework for Higher Education is an integral part of the Polish Qualifications Framework (PQF) and consequently, was developed with the same methodology.

The Polish Qualifications Framework will be a key element of the modernised qualifications system. It will describe how the qualifications relate to each other and integrate various national qualifications sub-systems. The PQF also includes a description of the hierarchy of the qualifications levels.

The Polish Qualifications Framework, like the European Qualifications Framework (EQF), will consist of eight qualifications levels. Each PQF level is described with the use of descriptors, that is, general statements indicating the learning outcomes relevant to a qualification at a given level. The PQF takes into account learning outcomes achieved through formal education or in other ways.

The descriptors of the European Qualifications Framework served as the reference point for the PQF descriptors, enabling a clear depiction to be made of how the proposed Polish qualifications levels relate to the eight levels of the EQF. They were defined in the PQF very similarly to the definitions in the Recommendation on the EQF – learning outcomes are described in the categories of knowledge, skills and social competence.

The descriptors in the PQF were developed to capture the full spectrum of learning outcomes. They reflect progress from the lowest to the highest level achieved by the learner. The PQF descriptors show how the scope and depth of knowledge, problem-solving and the application of knowledge in practice, learning and communication, as well as social competence, such as the willingness to work with others and assume a sense of responsibility for the tasks one is assigned to do, evolve through learning in different contexts and stages of life.

In developing the Polish Qualifications Framework, emphasis was placed on the need to ensure coherence and completeness of the general characteristic of the level. While elaborating the PQF descriptors, key descriptive categories were taken into account in each group of learning outcomes (knowledge, skills, social competence). Aspects which are essential for a "complete" description of the level of learning outcomes in each category were also taken into account (Table 1).

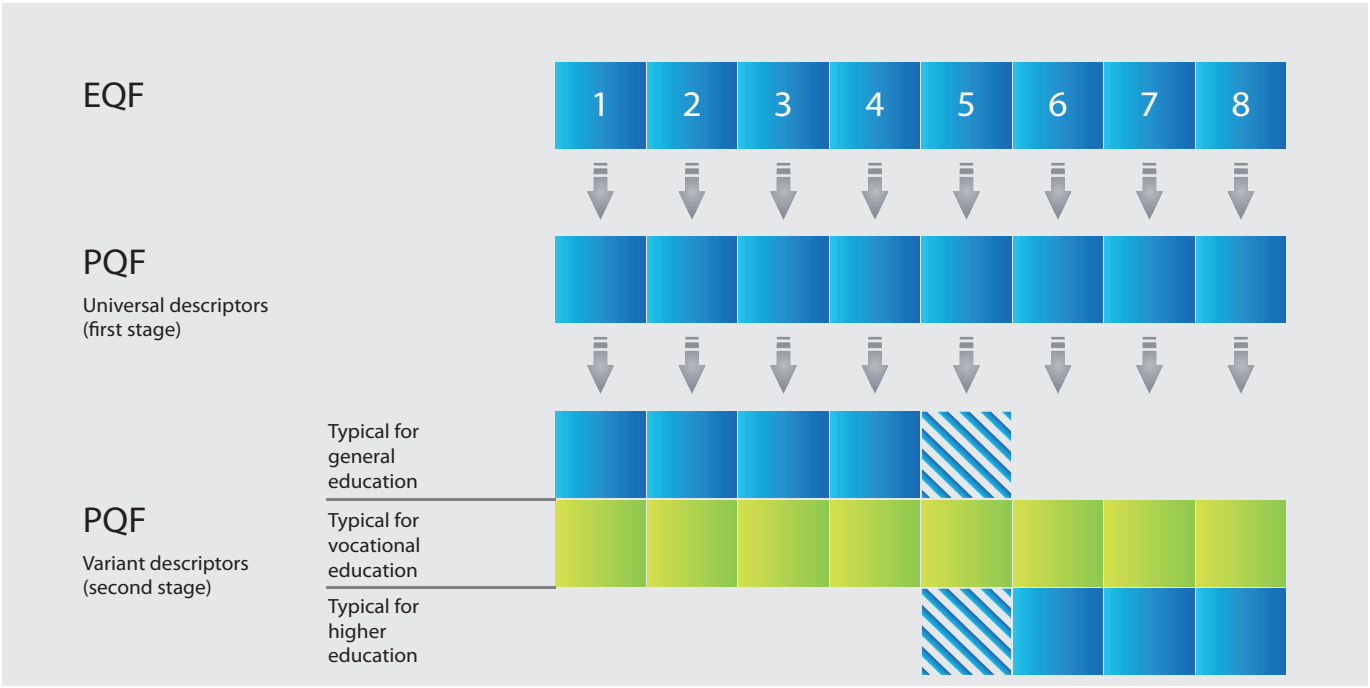
Table 1. Key descriptive categories and aspects of fundamental significance for the comprehensive description of knowledge, skills and social competence

Category of learning outcome	Key descriptive categories	Essential aspects for a complete description
KNOWLEDGE	Scope	– Completeness of the cognitive perspective
	Depth of understanding	– Dependencies
SKILLS	Problem solving and applying knowledge in practice	– Complexity of the problem – Innovation in the approach – Independence of actions – Conditions under which one acts
	Learning	– Independence – Methods
	Communication	– Scope of expression – Complexity of expression
SOCIAL COMPETENCE	Identity	– Participation – Sense of responsibility – Conduct
	Cooperation	– Team work – Conditions under which one acts – Leadership
	Responsibility	– Consequences of one's own actions – Consequences of a team's actions – Evaluation

Source: IBE.

A unique Polish solution is the introduction of two PQF descriptors of varying degrees of detail (see Figure 1). Universal descriptors (first stage) relate to all types of education. They are then more fully developed in three different types of descriptors (second stage): those typical for general eduation, those typical for vocational education and training, and those typical for higher education. Universal descriptors and second stage generic descriptors should be read together.

Figure 1. Descriptors in the Polish Qualifications Framework



Source: IBE

Second stage generic descriptors (typical for a particular type of education) can also be further detailed in the Polish qualifications system. An example of such descriptors (third stage) are those describing the eight broad areas of study that are already functioning in the regulations governing the National Qualifications Framework for Higher Education. Third stage generic descriptors are also being planned for various branches of activity, for example, in the form of sectoral frameworks. Tables of PQF universal descriptors and their comparison with EQF descriptors are presented in Part 6.2. Examples of more detailed descriptors typical for a given type of education are presented in Annex 2.1.
Universal descriptors for levels 6–8, serving as the basis for developing the descriptors of subsequent generic stages for higher education are presented in Table 2.

Table 2. The Polish Qualifications Framework – level 6–8 universal descriptors

	Level 6	Level 7	Level 8
KNOWLEDGE **a person knows and understands:**	• an advanced level of facts, theories, methods and the complex dependencies between them, • the diverse, complex conditions of conducted activities.	• an in-depth level of selected facts, theories, methods and the complex dependencies between them, also in relationship to other fields, • the diverse, complex conditions and axiological context of conducted activities.	• the world's scientific and creative achievements and the resulting implications of this for practice.
SKILLS **a person is able to:**	• innovatively complete tasks and resolve problems which are complex and non-routine under variable and not fully predictable conditions, • autonomously plan one's lifelong learning, • communicate with one's surroundings, substantiate one's position.	• complete tasks as well as formulate and solve problems with the use of new knowledge, also from other fields, • independently plan one's lifelong learning and direct others in this area, • communicate with various groups of respondents, appropriately substantiate one's position.	• analyse and creatively synthesise scientific and creative achievements to identify and solve research problems, as well as those related to innovative and creative activities, • contribute new elements to these achievements, • independently plan one's own development, as well as inspire the development of others, • participate in the exchange of experiences and ideas, also in the international community.
SOCIAL COMPETENCE **a person is ready to:**	• cultivate and disseminate models of good practice in the workplace and beyond, • make autonomous decisions, critically evaluate one's own actions, those of the team one directs and the organisations in which one participates, • assume responsibility for the results of those actions.	• establish and develop models of good practice in the environments of work and life • initiate actions, critically assess oneself, as well as the teams and organisations in which one participates, • lead a group and take responsibility for it.	• conduct independent research which contributes to existing scientific and creative achievements, • undertake professional and public challenges, taking into consideration their ethical dimension, assume responsibility for their results and develop models of good practice in such situations.

4.2. The description of learning outcomes (level descriptors) in the National Qualifications Framework for Higher Education

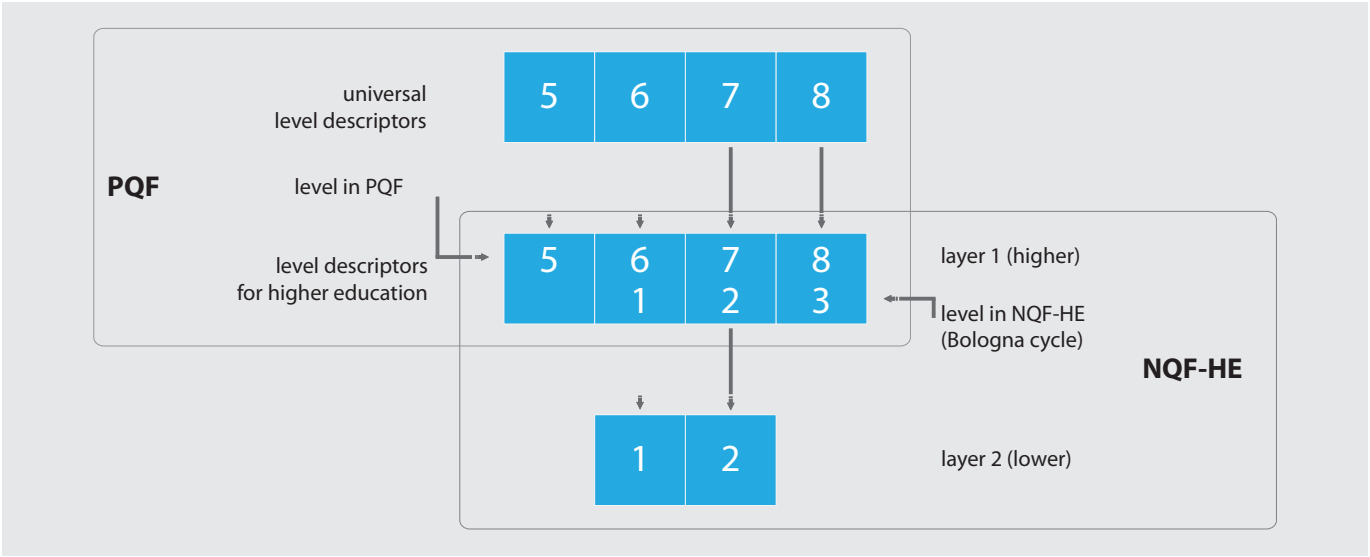
Two layers of descriptors

The level descriptors in the National Qualifications Framework for Higher Education for first and second cycle qualifications are described in two layers:

- the first, higher layer is made up of level 6 and 7 descriptors for the higher education sector and are equivalent to the qualifications awarded at the completion of the relevant first and second cycle studies, which are part of the PQF,
- the second, lower layer is made up of more detailed descriptions of competences (learning outcomes) corresponding to first and second cycle qualifications; they can be treated as an interpretation of the statements used in the higher layer, and facilitate their practical or operational use.

This two-layer structure describing learning outcomes is not used for third cycle qualifications – these are described solely in the form of the level 8 descriptors for the higher education sector as an element of the Polish Qualifications Framework.[15] This structure is illustrated in Figure 2.

Figure 2. The two-layer structure of the description of learning outcomes in the National Qualifications Framework for Higher Education



Further discussion in this section explains the two-layer structure of learning outcome descriptions (two-layer structure of level descriptors) corresponding to first and second cycle qualifications.

Qualifications profiling

Descriptions of learning outcomes in the lower layer reflect the concept of qualifications profiling used in the NQF-HE.

This is consistent with the original proposal of the Qualifications Framework for the EHEA, which defines a profile as "either the specific (subject) field(s) of learning of a qualification or the broader aggregation of clusters of qualifications or programmes from different fields that share a common emphasis or purpose (e.g. an applied vocational as opposed to more theoretical academic studies)".[16] Poland's NQF-HE deploys both concepts presented in this definition, whereas the term "profile" is used explicitly only in the second sense.

[15] In working on the learning outcomes constituting the second stage NQF-HE descriptors, the teams also developed the learning outcomes for third cycle qualifications. They were not, however, included in the regulations of the law.

[16] Bologna Working Group on Qualifications Frameworks (2005).

More specifically, learning outcomes for first and second cycle qualifications are described (in the lower layer) for:

– eight broad areas of study,
– two profiles corresponding to either more theoretically or more practically oriented studies.

Broad areas of study

Eight broad areas of study were distinguished, namely:

– humanities,
– social sciences,
– exact sciences,
– life sciences,
– engineering and technology,
– medical sciences, health sciences and physical education,
– agricultural, forestry and veterinary sciences,
– fine arts.

The classification developed is similar to the OECD/EUROSTAT/UNESCO classification of areas of knowledge (sciences). It also follows the national regulations relating to scientific research.[17]

The learning outcomes for each of the broad areas of study were defined to correspond to the descriptors of the higher layer of the NQF-HE.[18] They also were developed in consideration of international standards (solutions promoted internationally), if they existed for a specific area.

For example, the competence descriptors in engineering and technology take into account the competences corresponding to the completion of first and second cycle studies developed by the following national and international organisations and networks:

– ABET (Accreditation Board for Engineering and Technology, USA),[19]
– JABEE (Japan Accreditation Board for Engineering Education),[20]
– SBS (Subject Benchmark Statements, UK) for "Engineering" and "Computing",[21]
– IEA (International Engineering Alliance),[22]
– EUR-ACE (European Accredited Engineer project),[23]
– CDIO (Conceive-Design-Implement-Operate initiative).[24]

The structure of the lower layer of the two-layer level descriptors corresponding to first and second cycle qualifications is illustrated in Figure 3.

[17] Resolution of the Minister of Science and Higher Education of 8 August 2011 on fields of knowledge, science and the arts and disciplines of science and the fine arts (Journal of Laws 2011, No. 179, item 1065).

[18] Due to the sequence of activities in developing the PQF and NQF-HE (the NQF-HE was designed earlier), the manner of ensuring compatibility between the two is described in Part 5.1.

[19] ABET Engineering Accreditation Commission (2009);
http://www.abet.org/Linked%20Documents-UPDATE/Criteria%20and%20PP/E001%2009-10%20EAC%20Criteria%2012-01-08.pdf

[20] Japan Accreditation Board for Engineering Education (2008, 2009);
http://www.jabee.org/english/OpenHomePage/Criteria_Bachelor_2009.pdf
http://www.jabee.org/english/OpenHomePage/Criteria_Master_2008_1020.pdf

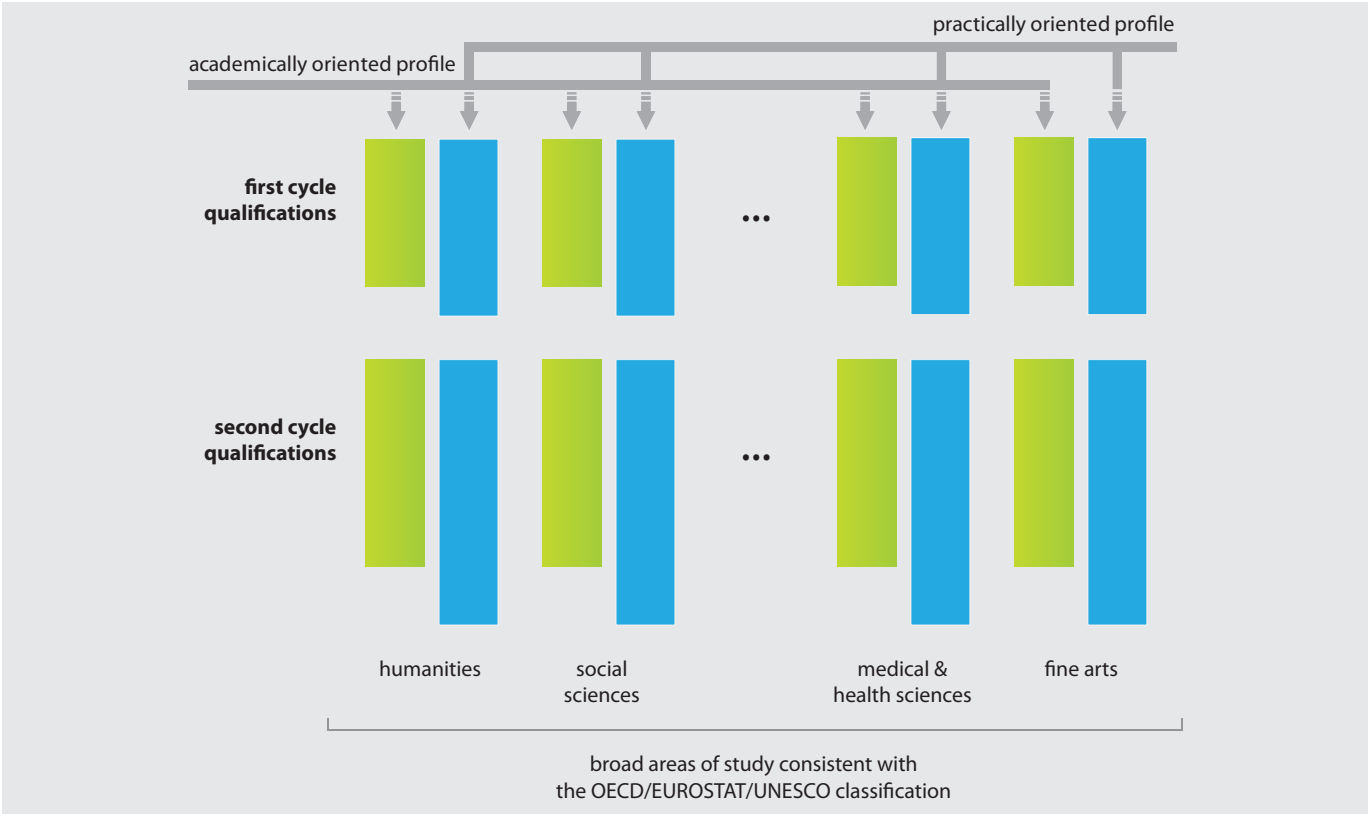
[21] Quality Assurance Agency; http://www.qaa.ac.uk/academicinfrastructure/benchmark/default.asp

[22] International Engineering Alliance: Graduate Attributes and Professional Competencies;
http://www.washingtonaccord.org/IEA-Grad-Attr-Prof-Competencies-v2.pdf

[23] European Network for Accreditation of Engineering Education, 2008;
http://www.feani.org/webenaee/pdf/EUR-ACE_Framework_Standards_20110209.pdf

[24] Crawley (2001); http://www.cs.fit.edu/~wds/cdio/CDIO.pdf

Figure 3. Structure of the lower layer of the two-layer level descriptors corresponding to first and second cycle qualifications



Source: Kraśniewski (2012b, pp. 19-48).

The parity and relevance of both educational profiles for the labour market

As can be seen in Figure 3, the "volume" of learning outcomes for practically oriented qualifications is generally larger than for academically oriented qualifications. This is mainly because practically oriented qualifications incorporate additional learning outcomes in the category of skills that can be obtained only through work-related experience (at least one semester of practical training at an enterprise or similar experience). This solution, aimed at showing that practically oriented programmes are in fact "better" – at least with regard to the set of skills obtained by the graduate – than their academically oriented counterparts, is one of the measures taken to address the issue of parity of esteem.

Although practically oriented studies clearly involve more training in skills, the learning outcomes for both profiles are defined so as to be relevant to the labour market. It is obvious that academically oriented programmes also include a substantial component of practical training necessary to develop the skills defined in the intended learning outcomes for this type of programme, consistent with the learning outcomes for each of the eight broad areas of study. For example, it would be difficult to imagine an academically oriented programme in a technical field that would not include a large proportion of practical training.

The learning outcomes for both profiles are formulated in such a way as to guarantee permeability in learning in the higher education system, i.e. the opportunity to undertake academically oriented second cycle studies upon completion of a practically oriented first cycle programme.

Learning outcomes for specific broad areas of study and educational profiles

Learning outcomes for first and second cycle qualifications of the eight broad areas of study and the two educational profiles, comprising the lower layer of the NQF-HE descriptors, are defined in the resolution of the minister.[25] Examples are presented in Annex 2.

[25] Decree of the Minister of Science and Higher Education of 2 November 2011 on National Qualifications Frameworks for Higher Education (Journal of Laws 2011, No. 253, item 1520).

4.3. The description of learning outcomes for study programmes

4.3.1. Learning outcomes for study programmes leading to first and second cycle qualifications

Formal requirements

The two-layer structure of level descriptors, more specifically its second, lower layer, forms the basis for the development of study programmes by higher education institutions.[26] The higher education institution (unit offering the studies) should describe each first and second cycle study programme (as well as the long cycle master's degree programmes, where such studies are available) according to:

- one or more of the eight broad areas of study to which it belongs,
- the profile – academic or practical – to which it belongs.

Considering the fact that Polish higher education institutions are classified by the Act – Law on Higher Education as either academic, i.e. those institutions that are eligible to award doctoral degrees, or vocational, i.e. those institutions that do not have this right, it must be noted that the programme profile is not related to the type of institution: an academic higher education institution can offer practically oriented study programmes, while a vocational one can offer academically oriented study programmes.

The learning outcomes for a study programme defined by a higher education institution or unit should be consistent with the learning outcomes presented in the resolution:

- for the relevant level of study (first or second cycle qualifications),
- for the corresponding broad area of study or – in the case of interdisciplinary programmes that span two or more areas – an appropriate combination of learning outcomes from the relevant areas of study,
- for the corresponding profile.

When developing a study programme, the higher education institution may disregard some of the learning outcomes specified in the ministerial regulation for the relevant broad area(s) of study. It must, however, substantiate this decision in the documentation for the programme.

These regulations may seem somewhat restrictive, but in fact they have brought a long sought after autonomy to higher education institutions in the development of study programmes. Earlier (up to 2012) constraints have been lifted, which allowed an institution to offer a study programme only in one of 118 fields with programme content partially regulated at the national level (with each exception requiring ministerial approval). Higher education institutions are now free to decide on the titles and contents of study programmes, as long as the intended learning outcomes are consistent with the level descriptors defined by the NQF-HE. This provides higher education institutions with the opportunity to diversify their educational offer, an opportunity that they will surely take advantage of to an increasingly greater degree.

The significance of learning outcomes

The intended learning outcomes, defined by higher education institutions (the entity offering studies) in the categories of knowledge, skills and social competences are the most important elements of the description of a study programme – they inform stakeholders and, at the same time, constitute a formal obligation, whose achievement will be the subject of analysis during the process of programme accreditation. Their importance is reflected in the regulation that requires them to be approved at the institutional level (by the senate or similar body), whereas decisions on all the other components of a study programme, such as the courses or modules comprising the curriculum, are decided at the faculty level or by another entity providing the studies.

[26] In the 2011/2012 academic year, when higher education institutions were adapting their study programmes to the requirements of the NQF, the higher layer of levels 6 and 7 descriptors for higher education were still in the design stage.

Supporting the process of developing study programmes

When designing study programmes, higher education institutions relied – at least to some extent – on the experiences of other Polish or foreign higher education institutions and especially partner institutions in the implementation of educational projects. They also took advantage of the results of international projects and other initiatives (networks, etc.), such as Tuning (Gonzales, Wagenaar, 2005). As a result of the Tuning project and activities of related thematic networks, the learning outcomes for more than 30 fields of study have been formulated (Adelman, 2011).
Also useful were the solutions adopted in other countries, such as the *Subject Benchmark Statements*[27] – descriptions of learning outcomes for more than 50 subject areas, some corresponding to several fields of study in Poland, but more frequently for groups of fields.
To support higher education institutions in the process of designing study programmes, examples of learning outcomes for a number of selected fields of study, compliant with the regulations on the NQF-HE, have been formulated by ministerially-appointed teams of experts involved in developing the Framework. Some of these examples have been formally accepted and published in a resolution as model learning outcomes,[28] issued by the minister. This resolution will be supplemented with more learning outcomes for additional study programmes. It must, however, be emphasised that the learning outcomes presented in the resolution, although formally acknowledged as "model" and comprising part of the legal regulations introducing the NQF-HE, are not obligatory for higher education institutions; they serve instead as examples of good practice. An institution offering a study programme in a particular field may adopt the corresponding learning outcomes completely, modify them, or ignore them and develop its own set of intended learning outcomes, more suitable to its mission and resources.

Intermediate layer of learning outcomes

When developing intended learning outcomes for a given study programme, the higher education institution (the entity offering the studies) may also consider the results of academic community initiatives intended to "translate" the level descriptors defined in the NQF-HE into statements suitable for a group of study programmes. Such "translations" can be undertaken by a group of higher education institutions offering programmes in the same or related field of study. For example, the vice-rectors or other representatives of faculties of research-oriented universities of technology offering programmes in electrical engineering, electronics, information technology, automation and robotics can define a subset of intended learning outcomes common to all programmes in this area. Clearly, such initiatives should not lead to the imposition of national-level "standards" that would preclude the much needed differentiation of programmes offered by different higher education institutions.
The "translation" of level descriptors specified in the NQF-HE for a group of study programmes creates an intermediate layer of learning outcomes, placed between the outcomes presented in the NQF-HE regulations and the intended learning outcomes defined by higher education institutions for specific study programmes. Such "translations" of learning outcomes may be undertaken by higher education institutions for a certain group of related or, in an extreme case, for all study programmes offered by the institution (for example, for all engineering programmes offered by a particular university of technology).

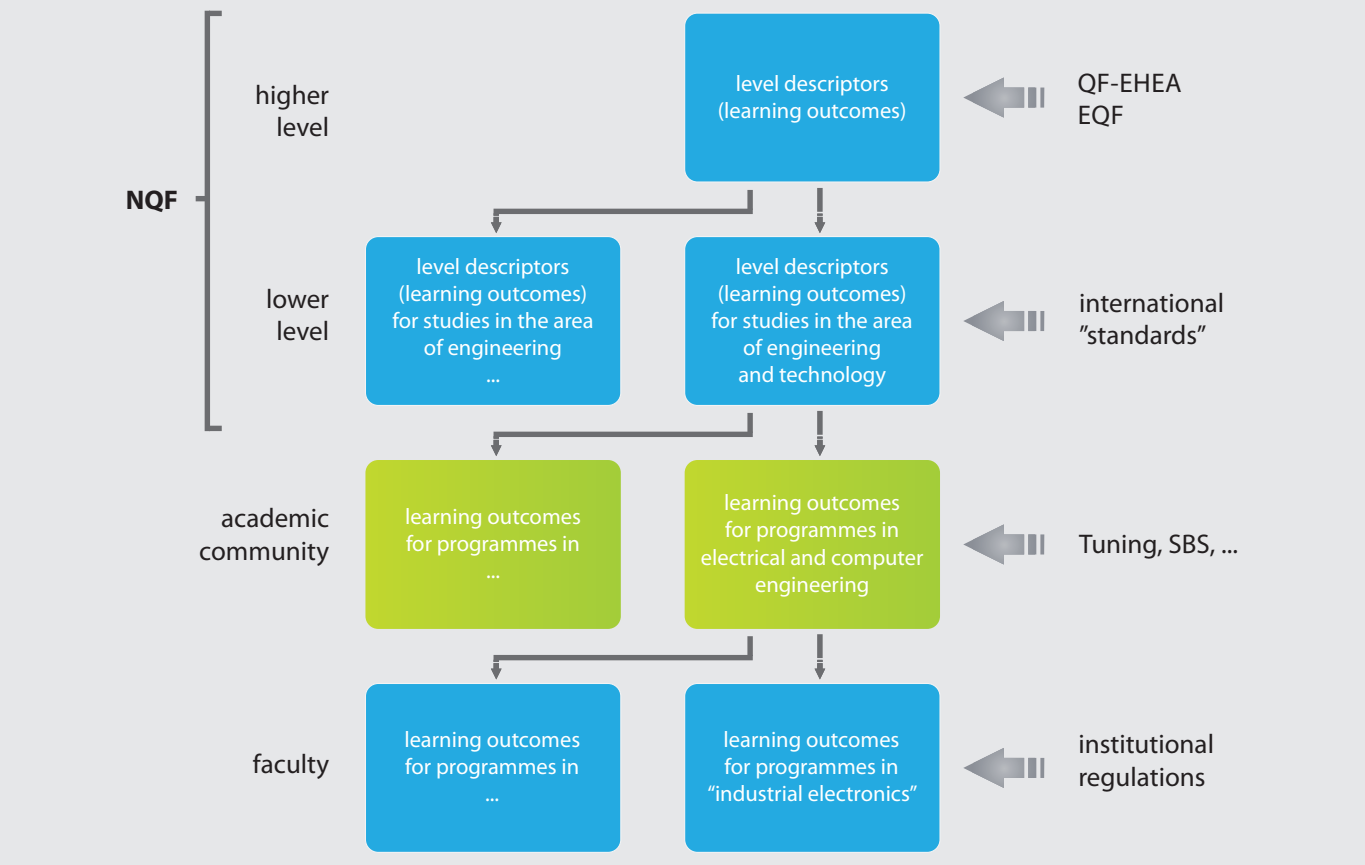
[27] Quality Assurance Agency; http://www.qaa.ac.uk/academicinfrastructure/benchmark/default.asp

[28] Decree of the Minister of Science and Higher Education of 4 November 2011 on model learning outcomes (Journal of Laws 2011, No. 253, item 1521).

Hierarchy of learning outcomes

The hierarchy of learning outcomes related to the Polish NQF-HE is illustrated in Figure 4.

Figure 4. The hierarchy of learning outcomes



Source: Kraśniewski (2012b, pp. 19–48).

Learning outcomes and vocational qualifications

The described process of developing intended learning outcomes for study programmes also applies, at least to some extent, to study programmes leading (indirectly, if extra professional development is necessary) to vocational qualifications regulated at the international level. For such programmes, learning outcomes also must be defined (i.e., for medical studies – according to the learning outcomes provided in the regulations for the field of medical, health and physical education sciences), but they and the process that leads to their achievement must additionally comply with the traditional standards related to "admission" and the manner of implementing the educational process developed in the international milieu. Hopefully, the outcomes of the review of European Commission Directive 2005/36/EC on, among others, the question of whether learning outcomes can be used to define the requirements of regulated professions, will make it possible to apply a unified learning outcomes-based approach to all study programmes.

Examples

The method and the results of defining learning outcomes for study programmes on the basis of level descriptors (learning outcomes) in the NQF-HE (lower layer – learning outcomes for the specific areas of study and educational profiles) are illustrated by the following examples:

1) first cycle studies – the study programme in "electronics" in the single area of study in engineering and technology,

2) first cycle studies – the study programme in "design" in multiple areas of study in fine arts, the humanities and social sciences,
3) second cycle studies – the study programme in "mathematics" in the single area of study in the exact sciences,
4) first and second cycle studies – the study programme in "information and library science" in the single area of study of the humanities.

Learning outcomes for the examples listed above are presented in Annexes 2.1.–2.4.

4.3.2. Learning outcomes for post-graduate study programmes

The Act – Law on Higher Education defines non-degree post-graduate studies as a form of education eligible to candidates who already have a minimum of first cycle level qualifications. Such studies conclude with the awarding of post-graduate qualifications (a certificate of completion of the studies).
The regulations in the Act require that the entity providing non-degree post-graduate studies defines the intended learning outcomes and confirms that they have been achieved by a graduate of the studies who has been awarded a certificate of completion.
Neither the Act nor resolutions issued on its basis define the NQF-HE (or PQF) level to which post-graduate qualifications are assigned. They also do not require higher education institutions to make such an assignment – in the case of a specific programme. Most certainly, such a requirement will be introduced in the future, and it can be expected that post-graduate qualifications will be assigned to levels corresponding to first and second cycle studies in the NQF for Higher Education (at PQF level 6 or 7).
Existing regulations also do not require non-degree post-graduate studies to be assigned to a specific broad area of study, nor, even more so, to reference the learning outcomes for such studies to the learning outcomes for first or second cycle studies defined in the ministerial resolution on the NQF-HE. This does not mean, however, that a higher education institution – e.g., for informational purposes – would be prohibited from undertaking such a referencing process.

Example

Annex 2.5 presents an example of an approach to defining the learning outcomes for non-degree post-graduate studies. The example used is for non-degree post-graduate studies in "Safeguarding information in networks and telecommunications systems: designing and auditing security measures", offered by the Warsaw University of Technology's Faculty of Electronics and Information Technology.

4.3.3. Learning outcomes for study programmes leading to third cycle qualifications

The solutions discussed earlier for PQF level 6 and 7 descriptors, which correspond to the qualifications descriptions of the first and second cycle in higher education (in terms of learning outcomes contained in the resolution of the Minister for the eight broad areas of study and the two educational profiles), do not have a counterpart at PQF level 8. Learning outcomes for third cycle qualifications in higher education corresponding to this level in the PQF are actually – to a certain degree (relating primarily to the outcomes achieved as the result of research work) – defined in the ministerial resolution,[29] but they are described in such general terms that they correspond to the highest generic level of the PQF (the universal descriptors).
Regulations governing doctoral education, however, require universities and other academic institutions, and more specifically – the units conducting such studies (treated in the Polish higher education system as third cycle studies) to define learning outcomes and design and implement study programmes leading to their achievement.

[29] Decree of the Minister of Science and Higher Education of 1 September 2011 on education during doctoral studies at higher education institutions and academic units (Journal of Laws No. 196, item 1169).

The intended learning outcomes for doctoral studies should be achieved as the result of:

1) undertaking a study programme that includes:
   a) research work conducted most often under the guidance of an advisor and assistant advisor, leading to a doctoral dissertation and attainment of a doctoral degree,
   b) coursework in the fundamentals of the broad area of study related to the field of research, at an appropriately advanced level,
   c) coursework related to the scientific discipline in which the doctoral studies are being conducted, at an appropriately advanced level and presenting the most recent achievements in that discipline,
   d) coursework that is not directly related to the scientific discipline of the doctoral studies, developing general professional competences, including research skills and social competences,
   e) practical training, such as teaching or contributing in some other form to the didactic process,
2) active involvement in the academic community – nationally and internationally,
3) fulfillment of the requirements associated with doctoral studies.

The ministerial regulation mentioned earlier determines the total workload associated with the taught elements of a doctoral programme (including the above mentioned types of courses). This component should account for 45–60 ECTS credits.

For quite some time now, applying ECTS to doctoral studies has been a matter of controversy and lively discussion in Poland and Europe. It appears that – despite many voices contesting this approach – the use of ECTS in regulations on doctoral studies is occurring in a steadily growing number of countries. The data published in a recent report commissioned by the European Commission show that among the 46 countries of the European Higher Education Area, 18 countries use ECTS throughout the programme (including its research component), in 10 countries it is used only for the taught elements of the programme, and in 18 countries it is not used at all.[30] Poland is included here in the last group of countries, which is not the case anymore; it can be assumed that since the report was published, using the ECTS has proliferated even further). Thus, the solution adopted in Poland is consistent with the trends observed in the European Higher Education Area.

Due to the time constraints imposed on the higher education system (doctoral programmes must be approved by May 2012), work on level 8 descriptors (implemented at the Educational Research Institute) and their further development into learning outcomes for doctoral studies (carried out by universities) occurred simultaneously, and in many cases, the work of the higher education institutions was completed ahead of the Institute's tasks. This does not mean that there is no connection between PQF level 8 descriptors and the learning outcomes defined for doctoral studies by specific higher education institutions. Interconnections were provided by:

- common sources – the earlier work of the General Council for Higher Education and the Working Group for the NQF for Higher Education, which included the development of proposed learning outcomes for doctoral studies,
- already existing – in the form of a ministerial resolution – descriptions of learning outcomes for second cycle qualifications (consistent with the essential characteristics of PQF level 7 descriptors), which could serve as the basis for formulating learning outcomes – and taking into account their progression – for specific third cycle study programmes,
- the participation of persons in work on the PQF who were also involved in developing study programmes, including doctoral studies, at leading higher education institutions, whose solutions were analysed and often adopted (with modifications) by other such institutions.

Therefore, the development of proposed PQF level 8 descriptors and the formulation of learning outcomes for doctoral studies carried out by higher education and other academic institutions can be considered as parallel, mutually interacting processes.

[30] *The European Higher Education Area in 2012*, Bologna Process Implementation Report, April 2012 (Figure 2.10, p. 42).

It is also worth noting that:

- legislative changes related to the implementation of the NQF resulted in unifying the principles of teaching in doctoral studies offered by higher education institutions and other academic institutions – institutes of the Polish Academy of Sciences, research institutes and international research institutes operating in Poland;
- attaining a third cycle qualification does not have to be connected with doctoral studies. The amended Act – Law on Higher Education has, admittedly, included a specific procedure for embarking on the process of obtaining a doctoral degree through doctoral studies, but it also guarantees the autonomy of this procedure – in accordance with the Law of 14 March 2003 on academic degrees and titles and on degrees and titles in the arts, amended at the same time as the Act – Law on Higher Education – which means that it is possible to be awarded a doctoral degree without undergoing doctoral studies. The competences of a person awarded this degree without doctoral studies may be, therefore, slightly different than the competences of a higher education institution graduate, as these are determined by the learning outcomes of doctoral studies. The congruence of these competences with PFQ level 8 descriptors should be ensured by the specific procedures of veryfing the learning outcomes obtained ouside of the formal education system, which would encompass, among others, obligatory doctoral examinations.

Example

Annex 3 presents an example of the approach to implementing the NQF-HE, in particular, defining the learning outcomes for third cycle studies. It uses the example of doctoral studies at Warsaw University of Technology (WUT), and the detailed implementation solutions are those of the Faculty of Electronics and Information Technology.

Part 5. Referencing the National Qualifications Framework for Higher Education to the Polish Qualifications Framework

5.1. Verifying alignment between the Polish Qualifications Framework and the National Qualifications Framework for Higher Education

Due to the agreed upon approach, where implementing the NQF-HE is regarded as a certain pilot project for carrying out the PQF, efforts to describe the learning outcomes for first and second cycle qualifications for the eight broad areas of study and the two educational profiles (coordinated by the Ministry of Science and Higher Education)[31] and the level 6 and 7 descriptors (conducted by IBE) were carried out partly in parallel. Generally, though, the Ministry's work was completed earlier than IBE's. This does not mean that there is no connection between the learning outcomes defined for first and second cycle qualifications in the NQF-HE and the PQF level 6 and 7 descriptors. Coordination was provided by:

- the premises adopted by the work teams and their methods of work in developing the learning outcomes for first and second cycle qualifications,
- the participation of some of the same people in the work on the PQF and development of the NQF-HE,
- the measures taken to ensure consistency between the NQF-HE and PQF, including analyses of this consistency conducted as part of the PQF project.

The way the teams worked in developing draft learning outcome descriptions for first and second cycle qualifications ensured that their results were consistent with the simultaneously developing descriptions of PQF level 6 and 7 descriptors.

For example, the team preparing draft learning outcome descriptions corresponding to first and second cycle qualifications for the field of technical studies performed a comparative analysis of the proposed learning outcomes with:

- the level 6 and 7 universal descriptors in the initial draft of the PQF (version of February 2009),[32]
- the level 6 and 7 descriptors in the European Qualifications Framework for lifelong learning,
- the first and second cycle descriptors of the Qualifications Framework for the European Higher Education Area (Dublin descriptors).

Comparisons were also made of proposed learning outcomes and the approved international standards in the field of engineering education, especially the solutions adopted in the EUR-ACE project.

The results of the analysis presented in the team's report on its work[33] showed a high degree of consistency between the proposed learning outcomes corresponding to first and second cycle qualifications in technical studies and the descriptions used in the comparisons, and in particular – the consistency of descriptors in corresponding levels of the European Qualifications Framework and the initial PQF draft.

The next analysis compared the sectoral descriptors of PQF levels 6 and 7 (related to the higher education sector) and the corresponding descriptions of learning outcomes for first and second cycle qualifications in higher education as defined in the decree on the NQF.[34] More specifically, comparisons were made of:

- the March 20, 2012 version of the draft descriptors of PQF levels 6 and 7 for higher education,

[31] The Resolution of the Minister of Science and Higher Education of 2 November 2011 on National Qualifications Frameworks for Higher Education was based on the results of this work.

[32] *Założenia Krajowych Ram Kwalifikacji dla polskiego szkolnictwa wyższego* [*Premises of the National Qualifications Frameworks for Polish Higher Education*] (2009).

[33] *Efekty uczenia się w obszarze studiów technicznych. Raport zespołu ds. opracowania opisu efektów uczenia się dla studiów technicznych (dla obszaru kształcenia inżynierów)* [*Learning outcomes in the broad area of technical sciences. The report of the Team on Learning Outcomes for Technical Studies (for Engineers)*], 2010.

[34] Decree of the Minister of Science and Higher Education of 2 November 2011 on National Qualifications Frameworks for Higher Education.

– the learning outcomes set forth in the above named resolution for first and second cycle qualifications of higher education achieved through the general academic profile for each of the eight broad areas of study.

The results of the analysis are presented in a study commissioned by IBE (Kraśniewski, 2012a).

The analysis confirmed a high degree of consistency between the specific learning outcome descriptions of each broad area of study and the PQF descriptors for the higher education sector. However, it also revealed certain inconsistencies. This was not surprising – they were a natural, inevitable consequence of a conscious choice, i.e. the strategy chosen to design and implement the NQF. This strategy assumed that developing and implementing the NQF-HE would be the first, pilot stage of activities, which in a sense, allowed the methodology to be verified and experiences to be gained to effectively carry out the main task – the development and implementation of the PQF, which also includes the formal general and vocational education systems.

The discrepancies identified were corrected in the draft sectoral descriptors of PQF levels 6 and 7. The remaining, minor inconsistencies can be eliminated through amendments to the resolution defining learning outcomes for first and second cycle qualifications in higher education.

5.2. Ensuring consistency between the PQF and the formal general and vocational education sectors

The National Qualifications Framework for Higher Education was developed as an autonomous part of a larger and coherent whole – the PQF, which will have eight levels. The NQF-HE includes qualifications appearing at PQF levels 6, 7 and 8. It is also anticipated that new qualifications in higher education may be developed in the future at PQF level five.

Qualifications gained through the formal general and vocational education system are at PQF levels 1–4. In particular, qualifications certified by the *matura* certificate, which is required for admission to higher education, are located at level four. This qualification can be achieved through general education (general upper secondary school), as well as vocational education (technical upper secondary school).

5.3. The National Qualifications Framework for Higher Education within the context of implementing the PQF

Of key significance, from the point of view of maintaining the coherence of the PQF – with the NQF-HE as its integral part – is ensuring that future activities to introduce the PQF, especially those of a legislative nature, guarantee the full consistency of the NQF-HE and the PQF.

In the process of formulating the legal framework for the PQF, the executive regulations implementing the NQF-HE in the Polish higher education system should be reviewed to ensure the consistency of the manner of describing qualifications attained in higher education institutions with how they are described in the other areas of the framework. The main premise for such a review should be to ensure the utmost clarity of these descriptions.

As learning outcomes for the eight areas of study are reviewed, the experiences from 2011 of various higher education institutions should be used, when they developed – as required by law – descriptions of qualifications for their study programmes. During this work, higher education institutions referred to the descriptions for the eight broad areas of study – the experiences gained in this work and the reflections it generated could undoubtedly improve these descriptions.

Part 6. Referencing the National Qualifications Framework for Higher Education to the European Qualifications Framework[35]

6.1. Criterion 1

Criterion 1. The responsibilities and/or legal competence of all relevant national bodies involved in the referencing process, including the National Coordination Point, are clearly determined and published by the competent public authorities.

In 2010, the Prime Minister established the Inter-ministerial Taskforce for Lifelong Learning, including the National Qualifications Framework to coordinate activities for the implementation of policy objectives in Poland for lifelong learning.[36] The Taskforce will function for the preparatory period leading to implementation of the qualifications framework. Chaired by the Minister of Education, the Taskforce includes the Minister of Science and Higher Education, the Minister of Economy, Minister of Labour and Social Policy, the Minister of Regional Development, Minister of Foreign Affairs and Head of the Chancellery of the Prime Minister.

The main responsibilities of the Taskforce are:
- to develop a strategic document on solutions for lifelong learning in Poland,
- to monitor the implementation of policies for lifelong learning, including the development of the PQF,
- to initiate cooperation between government administrative bodies, partners and relevant institutions for the implementation of lifelong learning policies,
- to initiate and monitor Polish participation in the work carried out in the European Union on lifelong learning, including the European Qualifications Framework.

In order to monitor the development and implementation of the PQF, a sub-team was established of the Inter-ministerial Taskforce – The Steering Committee of the National Qualifications Framework for Lifelong Learning (Steering Committee of the NQF). Chaired by the Minister of Science and Higher Education, the Committee is comprised of representatives delegated by:
- the Minister of National Education,
- the Minister of Economy,
- the Minister of Labour and Social Policy,
- the Minister of Regional Development,
- the Minister of Foreign Affairs,
- the Minister of Culture and National Heritage,
- the Minister of Health,
- the Minister of National Defence,
- the Minister of Internal Affairs,
- the Minister of Transportation, Construction and Maritime Economy,
- the Minister of Sport and Tourism.

Experts and representatives of the following groups may participate in the work of the Committee in an advisory capacity:
- associations of territorial government units,
- employer organisations,

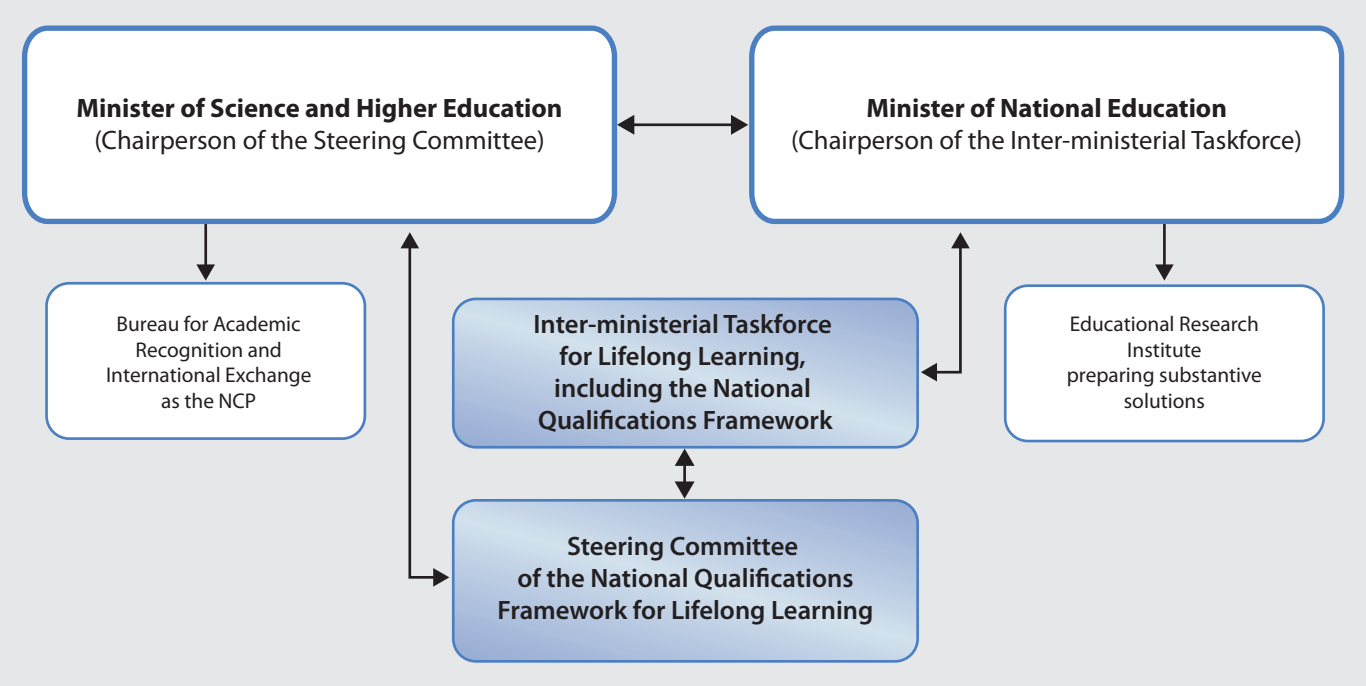
[35] Based on section 4 of the "Referencing Report. Referencing the Polish Qualifications Framework for Lifelong Learning to the European Qualifications Framework" (IBE 2013).

[36] Administrative order No. 13 of 17 February 2010 of the Prime Minister.

- trade unions,
- education system institutions,
- higher education,
- institutions offering training to the labour market and civil society,
- institutions awarding qualifications.

As a result of the developing work on implementing the qualifications framework, in 2010, the Minister of Science and Higher Education entrusted the Bureau for Academic Recognition and International Exchange[37] to function as the National Coordination Point. The Bureau is supervised by the Ministry of Science and Higher Education. The tasks of the National Coordination Point are "to ensure access to information and guidance on the relationship between the national qualifications system and the European Qualifications Framework and to support the participation of stakeholders in activities to compare and use qualifications at the European level". The Bureau represents Poland at meetings of international representatives of National Coordination Points.
Simultaneously, in 2010, the Minister of National Education commissioned the Educational Research Institute in Warsaw (IBE) to prepare comprehensive proposals to develop and implement the Polish Qualifications Framework and the referencing report. This task is carried out within the framework of a systemic project entitled "The development of terms of reference for the implementation of the National Qualifications Framework and the National Qualifications Register for lifelong learning".[38] The main result of the project will be to develop the overall concept of an integrated national qualifications system in Poland that includes the substantial and organisational premises, principles of operation and initial proposals for its most important components – the Polish Qualifications Framework and the Integrated Qualifications Register.

Figure 5. Institutions involved in preparing the implementation of an integrated qualifications system based on the Polish Qualifications Framework



Source: IBE

[37] Administrative order No. 37 of 28 July 2010 of the Minister of Science and Higher Education amending the resolution on the establishment of the Office for Academic Recognition and International Exchange (Official Journal of the Ministry of Science and Higher Education 2010, No. 4, item 68).

[38] Human Capital Operational Programme, Priority III, Measure 3.4, Sub-measure 3.4.1.

The diagram presented in Figure 5 is the result of the organisation of administrative departments in the government, defined by the Act of 4 September 1997 on departments in government administration.[39] The issue of qualifications, which affects all departments equally, is coordinated by inter-ministerial teams, which ensure appropriate representation. The issue of eventually assigning responsibility and authority for directing the ongoing management of activities and the further development of the integrated system has not yet been determined.

6.2. Criterion 2

Criterion 2. There is a clear and demonstrable link between the qualifications levels in the national qualifications framework or system and the level descriptors of the European Qualifications Framework.

The Polish Qualifications Framework (PQF) has a similar structure to the European Qualifications Framework (EQF). It has eight levels corresponding to the EQF levels. Confirmation of the congruence between PQF and EQF levels was provided by the results of the following analyses:

- comparison of basic concepts, the language of the text and assumptions in the PQF and EQF,
- comparison of the descriptions of learning outcomes (descriptors) at corresponding levels in both frameworks.

These comparisons are presented in the tables below.

A comparison of basic concepts, language of the text and assumptions in the PQF and EQF

In accordance with the concept of qualifications frameworks adopted in Europe, the PQF is based on learning outcomes. Learning outcomes appropriate for each level of the Polish Qualifications Framework are described in terms of knowledge, skills and social competence. Key terms used in the description of the structure and levels of the PQF are consistent with the definitions proposed in the Recommendation of the European Parliament and of the Council of 23 April 2008 on the establishment of the European Qualifications Framework for lifelong learning.[40] Existing differences in the wording are due to the specifics of the Polish language (concepts, terminology) and institutional conditions.

Each PQF level is defined by descriptors, which in general terms characterise the learning outcomes required for a given level. EQF descriptors served as the reference point for the PQF universal descriptors. The PQF universal descriptors can refer to descriptions of qualifications awarded both in the formal general, vocational and higher education systems, as well as out-of-school. It should be noted that the universal descriptors in the Polish Qualifications Framework develop further into three groups of second stage generic descriptors: those typical for general education, those typical for vocational education and training and those typical for higher education (see Part 4). Through the PQF universal descriptors, second stage generic descriptors typical for a given type of education also fully correspond to EQF descriptors.

The PQF uses a slightly different method of presenting level descriptors than is found in the EQF. The entries in the columns – knowledge, skills, social competence – are referenced to specific areas of learning or professional activity. The phrase "knows and understands" is used for the category of "knowledge"; the phrase "is able to" is used for the category of "skills". The phrase "is ready to" was accepted for the category of "social competence", by which two essential aspects are linked: axiological and psychological.

The correspondence of the definitions of learning outcome categories used in the PQF with the definitions set forth in the Recommendation is presented in Table 3.

[39] Act of 4 September 1997 on departments in government administration (Journal of Laws 2007, item 437).

[40] Recommendation of the European Parliament and of the Council of 23 April 2008 on the establishment of the European Qualifications Framework for lifelong learning (OJ C 111, 6.5.2008, pp. 1–7).

Table 3. Comparison of the language of basic concepts (categories of learning outcomes) in the PQF and EQF

The definitions of knowledge, skills and competence in the EQF were taken from the official translation of the Recommendation of the European Parliament and of the Council of 23 April 2008 on the establishment of the European Qualifications Framework for lifelong learning.

KNOWLEDGE		SKILLS		SOCIAL COMPETENCE	COMPETENCE
PQF	EQF	PQF	EQF	PQF	EQF
A set of descriptions of facts, principles, theories and practices assimilated during the learning process, relating to a field of learning or professional activity.	The outcome of the assimilation of information through learning. Knowledge is the body of facts, principles, theories and practices that is related to a field of work or study. In the context of the EQF, knowledge is described as theoretical and/or factual.	The ability to carry out tasks and solve problems related to the relevant field of learning or professional activity.	The ability to apply knowledge and use know-how to complete tasks and solve problems. In the context of the European Qualifications Framework, skills are described as cognitive (involving the use of logical, intuitive and creative thinking) or practical (involving manual dexterity and the use of methods, materials, tools and instruments).	The ability to shape one's own development as well as participate in professional and social life autonomously and responsibly, while taking into consideration the ethical context of one's own conduct.	The proven ability to use knowledge, skills and personal, social and/or methodological abilities, in work or study situations and in professional and personal development. In the context of the European Qualifications Framework, competence is described in terms of responsibility and autonomy.
The definition in the PQF reflects the exact meaning of the definition provided in the Recommendation of the European Parliament and of the Council of 23 April 2008. In the Polish understanding of the concepts "facts", "theories" or "rules of conduct", the theoretical or factual nature of knowledge is implied (implicit) in these terms.		The definition adopted in the PQF directly refers to the definition in the Recommendation of the European Parliament and of the Council of 23 April 2008. "Cognitive" and "practical" skills are not distinguished in the Polish language and therefore this passage is omitted – it is treated as self-evident.		The PQF adopted the term "social competence", which in Polish best captures the meaning of this category of outcomes. The definition adopted in the PQF is consistent with the definition in the Recommendation of the European Parliament and of the Council of 23 April 2008. It accurately reflects the meaning of the provisions contained in the EQF. The Polish language has no equivalent of the expression "proven ability to use". The literal translation of this phrase would be misleading. The accepted definition omits this word, as reference is made to validated learning outcomes in the context of the qualifications system.	

Table 4. The Polish Qualifications Framework – universal descriptors

PQF descriptors illustrate the accrual of learning outcomes, from the lowest to the highest level.

	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8
KNOWLEDGE **a person knows and understands:**	elementary facts and concepts as well as the dependencies between selected natural and social phenomena and the products of human thought	a broadened set of basic facts, simple concepts as well as the dependencies between selected natural and social phenomena and the products of human thought	basic facts and concepts as well as the dependencies between selected natural and social phenomena and the products of human thought; and also a broader scope of selected facts, concepts and dependencies in specific areas; the elementary conditions of conducted activities	a broadened set of basic facts, moderately complex concepts and theories as well as the dependencies between selected natural and social phenomena and the products of human thought; and also a broader scope of selected facts, moderately complex concepts, theories in specific areas and the dependencies between them; the basic conditions of conducted activities	a broad scope of facts, theories, methods and the dependencies between them; the diverse conditions of conducted activities	an advanced level of facts, theories, methods and the complex dependencies between them; the diverse, complex conditions of conducted activities	an in-depth level of selected facts, theories, methods and complex dependencies between them, also in relationship to other fields; the diverse, complex conditions and axiological context of conducted activities	the world's scientific and creative achievements and the resulting implications of this for practice
SKILLS **a person is able to:**	carry out very simple tasks according to detailed instructions under typical conditions; solve very simple, routine problems under typical conditions; learn under direct guidance in a structured form; understand simple statements and formulate very simple statements	complete simple tasks following general instructions most often under typical conditions; solve simple, routine problems most often under typical conditions; learn under guidance in a structured form; understand moderately complex statements, formulate simple statements; formulate and understand the simplest statements in a foreign language	complete moderately complex tasks following general instructions under partially variable conditions; solve simple, routine problems under partially variable conditions; learn partially autonomously under guidance in a structured form; understand moderately complex statements, formulate moderately complex statements; understand and formulate very simple statements in a foreign language	complete moderately complicated tasks, partially without instruction, often under variable conditions; solve moderately complex and somewhat non-routine problems often under variable conditions; learn autonomously in a structured form; understand complex statements, formulate moderately complex statements on a broad range of issues; understand and formulate simple statements in a foreign language	complete tasks without instruction under variable, predictable conditions; solve moderately complex and non-routine problems under variable, predictable conditions; learn autonomously; understand moderately complex statements, formulate moderately complex statements using specialised terminology; understand and formulate very simple statements in a foreign language using specialised terminology	innovatively complete tasks and resolve problems which are complex and non-routine under variable and not fully predictable conditions; autonomously plan one's lifelong learning; communicate with one's surroundings, substantiate one's position	complete tasks as well as formulate and solve problems with the use of new knowledge, also from other fields; independently plan one's own lifelong learning and direct others in this area; communicate with various groups of respondents, appropriately substantiate one's position	analyse and creatively synthesise scientific and creative achievements to identify and solve research problems as well as those related to innovative and creative activities; contribute new elements to these achievements; independently plan one's own development as well as inspire the development of others; participate in the exchange of experiences and ideas, also in the international community
SOCIAL COMPETENCE **a person is ready to:**	respect the obligations arising from membership in various communities; act and cooperate with others under direct supervision in structured conditions; evaluate one's own actions and take responsibility for the direct results of those actions	assume the obligations arising from membership in various communities; act and cooperate with others under direction in structured conditions; evaluate the actions in which one participates and take responsibility for the results of those actions	be a member of various types of communities, function in various social roles and assume the basic obligations ensuing from this; act and cooperate with others partially autonomously in structured conditions; evaluate one's own actions and those of the team; take responsibility for the results of those actions	assume responsibility for participating in various communities and functioning in various social roles; act and cooperate with others autonomously under structured conditions; evaluate one's own actions and those of persons one is directing; take responsibility for the results of one's own actions as well as those of the persons one directs	assume basic professional and social responsibilities, evaluate and interpret them; independently act and cooperate with others under structured conditions, direct a small team under structured conditions; evaluate one's own actions and those of others and the teams one directs; assume responsibility for the results of those actions	cultivate and disseminate models of good practice in the workplace and beyond; make decisions independently; critically evaluate one's own actions, those of the team one directs and the organisations in which one participates; assume responsibility for the results of those actions	establish and develop models of good practice in the environments of work and life; initiate actions, critically assess oneself as well as the teams and organisations in which one participates; lead a group and take responsibility for it	conduct independent research which contributes to existing scientific and creative achievements; undertake professional and public challenges, taking into consideration their ethical dimension, assume responsibility for their results and develop models of good practice in such situations

Analysis of the congruence between the PQF and EQF descriptors

In order to perform an analysis of congruence, a comparison was made of the relevant provisions in both frameworks. Tables 5a – 5d show how the PQF universal descriptors (first stage generic descriptors) correspond to the EQF descriptors. EQF descriptors are presented in Polish and English. The similarities and differences between them are distinguished by colour. The comparative analysis was performed using the following indicators:

- **green colour:** the PQF descriptor exactly or very closely corresponds to the EQF descriptor (consistency within the category of learning outcomes: knowledge, skills, social competence);
- **orange colour:** the EQF descriptor is implicitly expressed by the PQF universal descriptor (direct references are found in the second stage generic descriptors);
- **blue colour:** the PQF descriptor includes content that was not directly expressed by the EQF descriptor.

In analysing the specific entries in the tables below, it can be seen that the description of skills in the PQF is more detailed than in the EQF and includes problem solving, performing tasks and communication, while taking into account, among others, the complexity and typicality of tasks and problems, extent of autonomy (direction) and conditions under which activities are conducted. In addition, the PQF assumes that "learning" is a skill, but also a responsibility, which, if undertaken, is treated as a social competence. Consequently, "learning" is considered both a "social competence" as well as a "skill" when it appears in the colour blue.

Table 5a. Comparison of PQF universal descriptors with EQF descriptors – level 5

	EQF Descriptors	PQF Descriptors
KNOWLEDGE	Comprehensive, specialised, factual and theoretical knowledge within a field of work or study and an awareness of the boundaries of that knowledge *Obszerna, specjalistyczna, faktograficzna i teoretyczna wiedza w danej dziedzinie pracy lub nauki i świadomość granic tej wiedzy*	a person **knows and understands**: a broad scope of facts, theories, methods and the dependencies between them the diverse conditions of conducted activities
SKILLS	A comprehensive range of cognitive and practical skills required to develop creative solutions to abstract problems *Rozległy zakres umiejętności kognitywnych i praktycznych potrzebnych do kreatywnego rozwiązywania abstrakcyjnych problemów*	a person is **able to**: complete tasks without instruction under variable, predictable conditions solve moderately complex and non-routine problems under variable, predictable conditions learn autonomously understand moderately complex statements, formulate moderately complex statements using specialised terminology understand and formulate very simple statements in a foreign language using specialised terminology
COMPETENCE (SOCIAL)	Exercise management and supervision in contexts of work or study activities where there is unpredictable change; review and develop performance of self and others *Zarządzanie i nadzór w kontekstach pracy i nauki podlegających nieprzewidywalnym zmianom, analizowanie i rozwijanie osiągnięć pracy własnej oraz innych osób*	a person is **ready to**: assume basic professional and social responsibilities, evaluate and interpret them independently act and cooperate with others under structured conditions, direct a small team under structured conditions evaluate one's own actions and those of others and the teams one directs; assume responsibility for the results of those actions

Comments to Table 5a:

– the phrase in the EQF "review and develop performance of self and others" is expressed in the PQF by three statements: "assume basic professional and social responsibilities, evaluate and interpret them", "direct a small team under structured conditions", "evaluate one's own actions and those of others and the teams one directs".

Table 5b. Comparison of PQF universal descriptors with EQF descriptors – level 6

	EQF Descriptors	PQF Descriptors
KNOWLEDGE	Advanced knowledge of a field of work or study, involving a critical understanding of theories and principles *Zaawansowana wiedza w danej dziedzinie pracy i nauki obejmująca krytyczne rozumienie teorii i zasad*	a person **knows and understands**: an advanced level of facts, theories, methods and the complex dependencies between them the diverse, complex conditions of conducted activities
SKILLS	Advanced skills, demonstrating mastery and innovation, required to solve complex and unpredictable problems in a specialised field of work or study *Zaawansowane umiejętności wykazywania się biegłością i innowacyjnością potrzebną do rozwiązywania złożonych i nieprzewidywalnych problemów w specjalistycznej dziedzinie pracy lub nauki*	a person is **able to**: innovatively complete tasks and resolve problems which are complex and non-routine under variable and not fully predictable conditions autonomously plan one's lifelong learning communicate with one's surroundings, substantiate one's position
COMPETENCE (SOCIAL)	Manage complex technical or professional activities or projects, taking responsibility for decision making in unpredictable work or study contexts; take responsibility for managing the professional development of individuals and groups *Zarządzanie złożonymi technicznymi lub zawodowymi działaniami lub projektami, ponoszenie odpowiedzialności za podejmowane decyzje w nieprzewidywalnych kontekstach związanych z pracą lub nauką, ponoszenie odpowiedzialności za zarządzanie rozwojem zawodowym jednostek i grup*	a person is **ready to**: cultivate and disseminate models of good practice in the workplace and beyond make decisions independently critically evaluate one's own actions, those of the team one directs and the organisations in which one participates; assume responsibility for the results of those actions

Comments to Table 5b:

- the phrase in the EQF "critical understanding of theories and principles" corresponds in the PQF to "an advanced level", where a "critical understanding" is implicitly understood (this is stated *expressis verbis* in second stage generic descriptors),
- the statement in the EQF "in unpredictable (…) contexts" corresponds in the PQF to the words "make decisions independently; critically evaluate one's own actions, those of the team one directs and the organisations in which one participates" (virtually all the statements in second stage generic descriptors implicitly include the component of an "unpredictable context").

Table 5c. Comparison of PQF universal descriptors with EQF descriptors – level 7

	EQF Descriptors	PQF Descriptors
KNOWLEDGE	Highly specialised knowledge, some of which is at the forefront of knowledge in a field of work or study, as the basis for original thinking and/or research; critical awareness of knowledge issues in a field and at the interface between different fields *Wysoce wyspecjalizowana wiedza, której część stanowi najnowsza wiedza w danej dziedzinie pracy lub nauki, będąca podstawą oryginalnego myślenia lub badań; krytyczna świadomość zagadnień w zakresie wiedzy w danej dziedzinie oraz na styku różnych dziedzin*	a person **knows and understands**: an in-depth level of selected facts, theories, methods and the complex dependencies between them, also in relationship to other fields the diverse, complex conditions and axiological context of conducted activities
SKILLS	Specialised problem-solving skills required in research and/or innovation in order to develop new knowledge and procedures and to integrate knowledge from different fields *Specjalistyczne umiejętności rozwiązywania problemów potrzebne do badań lub działalności innowacyjnej w celu tworzenia nowej wiedzy i procedur oraz integrowania wiedzy z różnych dziedzin*	a person is **able to**: complete tasks as well as formulate and solve problems with the use of new knowledge, also from other fields independently plan one's own lifelong learning and direct others in this area communicate with various groups of respondents, appropriately substantiate one's position
COMPETENCE (SOCIAL)	Manage and transform work or study contexts that are complex, unpredictable and require new strategic approaches; take responsibility for contributing to professional knowledge and practice and/or for reviewing the strategic performance of teams *Zarządzanie i przekształcanie kontekstów związanych z pracą lub nauką, które są złożone, nieprzewidywalne i wymagają nowych podejść strategicznych;ponoszenie odpowiedzialności za przyczynianie się do rozwoju wiedzy i praktyki zawodowej lub za dokonywanie przeglądów strategicznych wyników zespołów*	a person is **ready to**: establish and develop models of good practice in the environments of work and life initiate actions, critically assess oneself as well as the teams and organisations in which one participates lead a group and take responsibility for it

Comments to Table 5c:

- the phrase in the PQF "knowledge and understanding of an in-depth level" also means familiarity with the "forefront of knowledge in a given field of work or study" as presented in the EQF,
- the phrase in the EQF "contexts that are complex, unpredictable and require new strategic approaches" is expressed in the PQF by three statements: "establish and develop models of good practice in the environments of work and life", "initiate actions, critically assess oneself as well as the teams and organisations in which one participates" and "lead a group" (virtually all the statements in second stage generic descriptors implicitly refer to the requirement of taking new strategic approaches in diverse and unpredictable contexts).

Table 5d. Comparison of PQF universal descriptors with EQF descriptors – level 8

	EQF Descriptors	PQF Descriptors
KNOWLEDGE	Knowledge at the most advanced frontier of a field of work or study and at the interface between fields *Wiedza na najbardziej zaawansowanym poziomie w danej dziedzinie pracy lub nauki oraz na styku różnych dziedzin*	a person **knows and understands**: the world's scientific and creative achievements and the resulting implications of this for practice
SKILLS	The most advanced and specialised skills and techniques, including synthesis and evaluation, required to solve critical problems in research and/or innovation and to extend and redefine existing knowledge or professional practice *Najbardziej zaawansowane i wyspecjalizowane umiejętności i techniki, w tym synteza i ocena, potrzebne do rozwiązywania krytycznych problemów w badaniach lub działalności innowacyjnej oraz do poszerzania i ponownego określania istniejącej wiedzy lub praktyki zawodowej*	a person is **able to**: analyse and creatively synthesise scientific and creative achievements to identify and resolve research problems as well as those related to innovative and creative activities contribute new elements to these achievements independently plan one's own development as well as inspire the development of others participate in the exchange of experiences and ideas, also in the international community
COMPETENCE (SOCIAL)	Demonstrate substantial authority, innovation, autonomy, scholarly and professional integrity and sustained commitment to the development of new ideas or processes at the forefront of work or study contexts, including research *Wykazywanie się znaczącym autorytetem, innowacyjnością, autonomią, etyką naukową i zawodową oraz trwałym zaangażowaniem w rozwój nowych idei i procesów w najważniejszych kontekstach pracy zawodowej lub nauki, w tym badań*	a person is **ready to**: conduct independent research which contributes to existing scientific and creative achievements undertake professional and public challenges, taking into consideration their ethical dimension, assume responsibility for their results and develop models of good practice in such situations

Comments to Table 5d:

– the EQF entry in the category of "knowledge" corresponds to the PQF entry because the mainstream of the world's development in science, art and technology occurs as a result of the interaction (interface) between various fields (this is written *expressis verbis* into second stage generic descriptors).

To summarise, it can be stated that the PQF descriptors correspond exactly to the EQF descriptors or are very close to them. The differences occur only when a phrase in the EQF is not directly expressed in the PQF universal descriptors, but is implicitly contained and reflected in second stage generic descriptors.

The comparison also shows that the universal descriptors of the PQF take more aspects into consideration in some of the entries. This is due to the approved concept of the Polish Qualifications Framework, which takes national conditions and contexts into consideration.

A feature of the situation in Poland is the reversal of the sequence of actions undertaken in developing the PQF. This occurred because other sectors were more advanced in their work on modernizing the qualifications system. First, the core curricula for general education, vocational education and the National Qualifications Framework for Higher Education were established by legal acts, and only later was work completed on the descriptors of the Polish Qualifications Framework. The authors of these documents were aware, however, of the ultimate model to be developed, and the leading paradigm in describing qualifications was the use of learning outcomes. Comparative analyses showed that the descriptions in the documents regulating the study programmes of the formal general, vocational and higher education systems are sufficiently congruent with the PQF level descriptors.

6.3. Criterion 3

Criterion 3. The national qualifications framework or system and its qualifications are based on the principle and objective of learning outcomes and linked to arrangements for validation of non-formal and informal learning and, where these exist, to credit systems.

Qualifications awarded in higher education

As of the 2012/2013 academic year, the National Qualifications Framework for Higher Education[41] will apply. This document generally defines the learning outcomes of eight broad areas of study for qualifications awarded upon completion of first and second cycle studies. The study programmes of the particular fields referred to, offered by higher education institutions, must be described with the use of learning outcomes and specify how these outcomes will be verified.[42] For third-cycle studies (doctoral), regulations from the Minister of Science and Higher Education[43] describe the expected learning outcomes in more general terms than for first and second cycle studies. Attaining this qualification is, however, conditioned on acquiring a doctoral degree according to a precisely defined procedure that includes strong quality assurance mechanisms. The changes introduced have garnered considerable support among higher education directors, but some critical opinions from the academic community have also been raised. Many university teachers faced with the need to change their approach are encountering various difficulties, but the situation is systematically improving.

Validation of learning outcomes attained outside of the formal education system

Higher education

In higher education, the procedures for validating learning outcomes achieved outside of this system can be determined by individual higher education institutions. The law on the operation of higher education does not provide any general regulations governing this issue. An important direction in the development of the national qualifications system is increasing opportunities for higher education institutions to validate learning outcomes achieved elsewhere. Research and analyses conducted at the Educational Research Institute under the auspices of the sub-project "Confirming learning outcomes (validation) in higher education institutions", was completed in the spring of 2013. The results of this work were published in October 2013. The aim of the analyses was to develop a model of validating learning outcomes adapted to the needs of higher education institutions and accreditation bodies. The proposed amendments to the Act on changes to the Law on higher education prepared by the Ministry of Science and Higher Education anticipate the introduction of regulations significantly broadening the ability to validate competences acquired outside of the higher education system.

Validation of competences attained outside of the formal general, vocational and higher education systems

Awarding diplomas and certificates in different communities occurs on the basis of various legal provisions. A variety of solutions and procedures are applied to define the conditions under which validation can occur, how it is performed and to assure the quality of qualifications.

[41] Resolution of the Minister of Science and Higher Education of 2 November 2011 on the National Qualifications Framework for Higher Education.

[42] Resolution of the Minister of Science and Higher Education of 5 October 2011 on the conditions required to conduct studies in a specific field and level of education (Journal of Laws 2011, no. 243, item 1445).

[43] Resolution of the Minister of Science and Higher Education of 1 September 2011 on doctoral studies in universities and academic entities.

An example of the ability to validate outside of the formal general, vocational and higher education systems was introduced by the Act on promoting employment,[44] which makes it possible for participants of "vocational preparation for adults" to take "verifying examinations".
One of the important objectives of the forthcoming modernisation of the qualifications system in Poland is to develop the principles, standards and methods for validation, while accounting for the transparency of these processes. Work is underway on making an inventory and standardising the descriptions of all qualifications established by legislation (as part of the development of a qualifications map for Poland).[45] The results of this inventory provide an important foundation for consideration during the development of the national qualifications system.
Work is also underway on a concept of the quality assurance principles for the national qualifications system in Poland. One of its essential elements will be the principles of ensuring the quality of validation. Studies carried out indicate that there are also many other projects underway in Poland to develop validation procedures and increase the number of persons benefiting from this type of opportunity. These include government projects as well as trade and other industry initiatives. The results and recommendations ensuing from these projects also are used in developing the concept of qualifications' quality assurance principles.[46]

Credit accumulation and transfer

In Poland, accumulating and transferring credits within the higher education system functions in the form of ECTS (*European Credit Transfer and Accumulation System*). The ECTS has been fully adopted by Polish higher education institutions – its implementation was required by legislation.[47] The proper application of the ECTS system is one element of the programme assessment carried out by the Polish Accreditation Committee (see Part 6.5).
The vocational education core curriculum required as of the 2012/13 school year introduces a new way of describing (by using learning outcomes) and acquiring qualifications. The core curriculum distinguishes coherent sets of learning outcomes that can be validated within the framework of out-of-school learning, as well as accumulated and recognised to obtain successive qualifications. The concept of having sets of learning outcomes distinguished in a qualification is consistent with the ECVET system developed in Europe (*European Credit System for Vocational Education and Training*).
At this stage, credit accumulation and transfer cannot yet be implemented in formal general education at schools. Work is still underway on a comprehensive model of credit accumulation and transfer,[48] which will also include general education. Elements of this system will also include the already functioning ECTS and ECVET, with their implementation currently being prepared. It is assumed that the solutions developed will allow for credits to be accumulated and transferred regardless of where and how they are validated. It is expected that the developed model will define, among other things: the principles for distinguishing units of learning outcomes from qualifications and methods of awarding credits to sets of distinct learning outcomes. Work on the model of credit accumulation and transfer is scheduled to be completed in 2013. The next task will then be to prepare and gradually implement the mechanisms of the system in specific sectors.
The course of this work to date shows that securing agreement and implementing procedures enabling credit accumulation and transfer, especially between sectors (general, vocational and higher education) will require certain difficulties to be overcome, because this system contradicts established practices. Convincing educational, professional and sectoral organisations to change their approach will require some effort.

[44] Act of 20 April 2004 on promoting employment and labour market institutions (Journal of Laws 2008, No. 69, item 415 with later amendments).

[45] Within the framework of "The *development of terms of reference for the implementation of the National Qualifications Framework and the National Qualifications Register for lifelong learning"* Project.

[46] *Ibidem*.

[47] Act of 27 July 2005 on the Law on higher education (Journal of Laws 2012, item 572 with later amendments).

[48] Within the framework of *The development of terms of reference for the implementation of the National Qualifications Framework and the National Qualifications Register for lifelong learning* Project.

6.4. Criterion 4

Criterion 4. The procedures for inclusion of qualifications in the national qualifications framework or for describing the place of qualifications in the national qualification system are transparent.

It was agreed that the general principles for assigning PQF levels to qualifications should be applied to all the qualifications in the integrated national qualifications register. This would include those qualifications awarded in the formal general, vocational and higher education systems, as well as those awarded outside of these systems.

The qualifications currently awarded in the formal general, vocational and higher education systems will formally have PQF levels assigned to them based on a detailed analysis of their required learning outcomes. These qualifications will be a basic key resource to start off the qualifications register. For the purposes of the referencing process, a preliminary determination of the level of these qualifications[49] was made by performing a detailed comparison of the required learning outcomes with the appropriate descriptors in the PQF. The results of comparing examples of qualifications are presented in Annex 5 of the "Referencing Report".

After implementing the new solutions enabling the integrated system to function, determining the PQF level for qualifications will be possible in two ways. For qualifications established by ministers (which are awarded based on regulations in the law) or institutions under their jurisdiction, assigning a PQF level will occur when the qualification is developed, and the formal determination of its PQF level will take place when the qualification enters into force.[50] During the period of implementing the new solutions, the relevant minister or institution under his/her jurisdiction will be responsible for determining the proper PQF level for qualifications under his/her authority.

The remaining qualifications will have PQF levels assigned to them according to strictly defined procedures as they are entered into the integrated qualifications register. Standards will be set for describing qualifications submitted for entry into this register. Not only will learning outcomes be required to be included in the description of the registered qualification, but also its validation and quality assurance processes. Procedures for entering qualifications into the integrated register will include a detailed review of the compatibility of learning outcomes with PQF level descriptors. A quality assurance system for these processes is anticipated, related to registering a qualification based on an application submitted by an interested entity. This will ensure the reliability of assigning a PQF level to a qualification.

Proposals for legal solutions on the principles of assigning PQF levels to qualifications are currently being prepared. Work is also underway on the procedures for assigning levels (see Annex 4 of the "Referencing Report"). It is focused on such issues as: the criteria for assessing the compatibility of learning outcomes to PQF descriptors, documentation guidelines, the composition and working procedures of the teams assigning PQF levels to qualifications. Precisely defining and then complying with principles and procedures for assigning PQF levels to qualifications will have significant meaning for the transparency of qualifications, and thus the credibility of the entire system. Work on these principles with the participation of stakeholders provides the opportunity to design solutions understood by a broad range of users.

[49] See Part 1 of the "Referencing Report".

[50] For example, a resolution issued by a minister, a resolution passed by the senate of a higher education institution.

6.5. Criterion 5

Criterion 5. The national quality assurance system(s) for education and training refer(s) to the national qualifications framework or system and are consistent with the relevant European principles and guidelines (as indicated in Annex 3 of the Recommendation).

Currently, quality assurance procedures are applied to all qualifications awarded in the formal general and vocational education system, higher education, as well as some other qualifications, such as those in the craft trades. In the formal general and vocational education systems, the procedures comply with European guidelines for quality assurance in: vocational education and training – *European Quality Assurance Reference Framework for VET* (EQARF), validation – *European Guidelines for validating non-formal and informal learning* (CEDEFOP 2009) and higher education – *Standards and Guidelines for Quality Assurance in the European Higher Education Area* (ESG). A system of pedagogical supervision functions in formal general and vocational education below higher education, and external examinations also play an important role. In higher education, assessment is the responsibility of an independent body – the Polish Accreditation Committee (PAC), which submits the results of its assessments to the Minister of Science and Higher Education.

In Poland, institutions of higher education are directly responsible for the quality of awarded qualifications and the study programmes leading to them. They are legally required to operate an internal quality assurance system. The purpose of the external quality assurance system in higher education is primarily to verify the functioning of the internal quality assurance systems of higher education institutions.

The minister responsible for higher education defines the basic foundation of these systems by formulating:

- the requirements for describing qualifications,
- the National Qualifications Framework for Higher Education, which includes descriptions of learning outcomes for the eight broad areas of study,
- the organisational requirements of a higher education institution, especially with regard to the number and qualifications of staff required to offer studies in specific fields,
- the requirements of the study programme,
- the principles of programme and institutional assessment of a higher education institution.

A higher education institution is required by law to be assessed by the Polish Accreditation Committee (its programmes or institutions). Assessments can also performed by one of the institutions established by the academic community or it can undergo an accreditation process of an international body.

The Polish Accreditation Committee – an independent entity acting on the basis of the Act on higher education – performs external assessments of the quality of education, as well as of the qualifications awarded. The PAC is a member of the European Association for Quality Assurance in Higher Education (ENQA) and is also registered with the European Register of Quality Assurance Agencies (EQAR). The PAC is also a member of the European Consortium for Accreditation (ECA), the Central and Eastern European Network of Quality Assurance Agencies in Higher Education (CEENQA) and the International Network of Quality Assurance Agencies in Higher Education (INQAAHE). The PAC performs its activities in accordance with "Standards and guidelines for quality assurance in the European Higher Education Area".

The PAC accredits programmes and institutions. Programme accreditation includes an assessment of, among others:

- whether the learning outcomes determined by the higher education institution for a given study programme are congruent with the descriptors for the given field in the National Qualifications Framework for Higher Education,
- whether the conditions of conducting studies and the educational process enable these outcomes to be attained,

– whether the learning outcomes are properly validated.

An institutional accreditation takes into account the following issues, among others:

– the operation and improvement of internal quality assurance systems for education,
– the accreditation or certification from international institutions obtained by the faculty of the higher education institution,
– the results of the previously performed programme accreditation.

The assessment procedure conducted by PAC is free of charge, mandatory and cyclical. In the case of a negative assessment, the minister responsible for higher education revokes or suspends the ability to provide higher education.

6.6. Criterion 6

Criterion 6. The referencing process shall include the stated agreement of the relevant quality assurance bodies.

After accepting the report by the Inter-ministerial Taskforce for Lifelong Learning, including the National Qualifications Framework, the referencing report was presented to the following bodies responsible for quality assurance of the Polish qualifications system:

– Educational Quality Department in the Ministry of National Education,
– Central Examination Board,
– Polish Accreditation Committee.

After reviewing the referencing report, these institutions submitted comments and suggestions, which were taken into consideration in the version of the report presented to the Committee for European Affairs.

The written formal approval of the report from these institutions is presented in Annex 1 of the Polish referencing report.

6.7. Criterion 7

Criterion 7. The referencing process shall involve international experts.

The development of the "Self-certification Report of the National Qualifications Framework for Higher Education in Poland" was closely linked to work on the referencing report of the Polish Qualifications Framework. Parts of the referencing report devoted to PQF levels 6–8 were discussed with international experts during its preparation and corrected according to their comments. These experts were Aileen Ponton, Michael Schopf, Eduard Staudecker and Erzsébet Szlamka. Independent of this cooperation, the Polish team working on the Self-certification Report invited two international specialists in qualifications frameworks for higher education – Prof. Mile Dželalija from Croatia and Prof. Ruth Whittaker from Scotland. Erzsébet Szlamka from Hungary joined them from the expert group working on the referencing report. The international experts joined the team's work during the consultation phase, when the main body of the report had already been prepared, but could still be corrected or changed based on the experts' reviews.

Prof. Mile Dželalija is a professor of physics at the University in Split. He is also a renowned international expert on qualifications frameworks, which is reflected, among others, in his many activities and posts, among them:

- as of 2011, a member of the Croatian National Team of Bologna Experts,
- as of 2010, leading development of the Referencing report of the Croatian Qualifications Framework to the EQF and the QF-EHEA,
- as of 2009, a member of the management group of the South-East-Europe Network for NQF in Higher Education,
- as of 2008, a member of the EQF Advisory Group of the European Commission,
- as of 2006, a member of the National Committee for Croatian Qualifications Framework development/implementation.

Members of the team preparing the Self-certification Report have very positive experiences in working with Croatian colleagues in designing and implementing the qualifications framework. In the first phase of work on the NQF-HE, Croatia was Poland's official international partner.
Prof. Ruth Whittaker of Scotland was asked to join our work on this report also because of her achievements in working on qualifications frameworks for higher education. Prof. Whittaker directs the Centre for Learning Enhancement and Academic Development (GCU LEAD) at Glasgow Caledonian University. She is responsible specifically for research and development in the recognition of prior learning (RPL). She leads a programme of strategic development for the entire university in this area. The projects she directed included developing the national guidelines for the SCQF RPL, models and resources supporting RPL in the *Learning and social development* sectors and others. Future tasks include, among others, developing the national principles for implementing RPL in higher education in Scotland. Prof. Whittaker is the Chairperson of the QAA Scotland/Universities Scotland RPL HEI Network and a member of the Steering Group of the European RPL Network. She also serves in other capacities on national and international groups working on lifelong learning and higher education issues.
The schedule of work with foreign experts on the Self-certification Report is as follows:[51]

Meeting dates	Meeting topics
November 9, 2012 Warsaw	– official inauguration of the cooperation with international experts – presentation of the most important theses on the proposed qualifications framework for higher education in Poland – setting the calendar and mode of further work
January 2, 2013	– presentation of the Self-certification Report to the international experts for their consultation
January 18 and 21, 2013	– the Polish team receives the comments of the international experts
January 21, 2013	– planned meeting of the team and international experts in Warsaw – discussion of the report
May 15, 2013	– approval of the final version of the Self-certification Report by the Polish team

In addition to involving international experts in the work on the Self-certification Report of the qualifications framework for higher education, extensive use was made of the experiences of other countries and cooperation was established with other foreign qualifications framework experts. Polish representatives participate in the meetings of the Network of National Correspondents of NQF for HE. Expert teams developing and implementing the framework made several study visits to other countries, individual experts participated in numerous international initiatives (see Part 3.5). The experiences of implementing qualifications frameworks for higher education were used, for example, by the European Training Foundation in disseminating good practices in countries less advanced in implementing NQFs.

[51] Reports of the meetings with international experts are available at the project's website: http://kwalifikacje.org.pl/.

6.8. Criterion 8

Criterion 8. The competent national body or bodies shall certify the referencing of the national qualifications framework or system with the EQF. One comprehensive report, setting out the referencing and the evidence supporting it shall be published by the competent national bodies, including the National Coordination Point, and shall address separately each of the criteria.

The proposed referencing report was presented to the Steering Committee for the National Qualifications Framework for Lifelong Learning for consultation. Once their comments were incorporated into the report, it was approved by the Inter-ministerial Taskforce for Lifelong Learning, including the National Qualifications Framework[52] at its meeting of April 15, 2013.
After consultations required by law with government ministries were completed, the referencing report received approval of the Commission on European Affairs, acting on behalf of the Council of Ministers (Government of the Republic of Poland) on May 15, 2013.
The referencing report will be posted on the government's official Internet site.

6.9. Criterion 9

Criterion 9. The official EQF platform shall maintain a public listing of member states that have confirmed that they have completed the referencing process, including links to completed referencing reports.

After completion of the referencing process, the referencing report will be submitted to the European Commission in order to include it into the official platform of the European Qualifications Framework. The version of the report to be placed on the EQF platform includes the comments and suggestions of the EQF Advisory Group, which were provided after the report was presented at their meeting of May 29, 2013.

6.10. Criterion 10

Criterion 10. Following the referencing process, and in line with the timelines set in the Recommendation, all new qualification certificates, diplomas and Europass documents issued by the competent authorities contain a clear reference, by way of national qualifications systems, to the appropriate European Qualifications Framework level.

The intent is to have the PQF level noted on awarded qualifications in the formal general, vocational and higher education systems as of the 2013/14 school year, before implementation of the national qualifications register, on the basis of regulations issued by the relevant ministers.
The timeframe for having information about the PQF level included on all diplomas and certificates in the register, as well as Europass documents that refer to qualifications, will be determined after the relevant public authorities adopt the scenario for implementing the integrated qualifications system.
The implementation scenario is currently being discussed and negotiated with representatives of ministerial departments on the Steering Committee for the National Qualifications Framework.

[52] In Poland, the Inter-ministerial Taskforce fulfils the most important functions of the National Coordination Point.

Part 7. Analysis of the National Qualifications Framework for Higher Education in fulfilling the referencing criteria and procedures of the Qualifications Framework of the European Higher Education Area

The Annex of the "EQF criteria and procedures for referencing"[53] for higher education presents the following criteria for referencing national qualifications frameworks to the QF EHEA together with the procedures to verify alignment.

7.1. Criteria for the alignment of national frameworks to the Qualifications Framework of the European Higher Education Area

7.1.1. Criterion 1

Criterion 1. The national framework for higher education qualifications and the body or bodies responsible for its development are designated by the national ministry with responsibility for higher education.

Expert groups working on the National Qualifications Framework for Higher Education were appointed by the minister responsible for science and higher education. Their work took place under the aegis of the ministry (see the previous section). The National Coordination Point was located at the Bureau for Academic Recognition and International Exchange at the Ministry of Science and Higher Education. A Steering Committee for the National Qualifications Framework for Lifelong Learning was established at the level of the Prime Minister, and its activities are directed by the minister responsible for higher education.

7.1.2. Criterion 2

Criterion 2. There is a clear and demonstrable link between the qualifications in the national framework and the cycle qualification descriptors of the European framework.

Levels 6–8 of the Polish Qualifications Framework and their descriptors correspond to the first through third cycles of European higher education and their appropriate descriptors. An analysis of this alignment is presented in Part 6 of this document. At this time in Poland, there is no "short cycle" corresponding to the fifth level of the European Qualifications Framework, although this issue is currently being studied (see Part 9.2.).

7.1.3. Criterion 3

Criterion 3. The national framework and its qualifications are demonstrably based on learning outcomes and the qualifications are linked to ECTS or ECTS compatible credits.

The amended Act on Higher Education of 18 March 2011 and its accompanying regulations promulgated by the Minister of Science and Higher Education legally require all higher education institutions in Poland to use learning outcomes in developing study programmes for all cycles and postgraduate studies.

[53] *Criteria and procedures for referencing national qualifications levels to the EQF*; http://ec.europa.eu/education/lifelong-learning-policy/doc/eqf/criteria_en.pdf.

Work on their development occurred during the 2011/12 academic year, and as of October 1, 2012, all study programmes admitting students must be presented with the use of learning outcomes. The ECTS system was already introduced in Poland in 2005 with passage of the Act on Higher Education. All higher education institutions are required by law to accumulate and transfer credits for students in first and second cycle studies (EQF levels 6 and 7). As of the 2012/13 academic year, this credit system must also include doctoral studies (third cycle, EQF level 8) and postgraduate studies.

7.1.4. Criterion 4

Criterion 4. The procedures for inclusion of qualifications in the national framework are transparent.

Qualifications achieved in the Polish higher education system are entered into a special register operated by the Ministry of Science and Higher Education. When a higher education institution autonomously develops a new study programme, it is legally required to report this to the Ministry. The minister then decides through a formal administrative procedure to enter this information into the register. From the moment of registration, the new study programme is included into the state's monitoring system, whereas the higher education institution, after validating a student's achievement of the new programme's learning outcomes, has the right to confer a diploma recognised by the state that certifies the qualification. From the moment the study programme is entered into the register, it is subject to quality assurance reviews performed under law by the Polish Accreditation Committee. PAC enters this qualification into its work schedule and assesses its quality after the diplomas are awarded to the first graduates of the study programme. However, should the minister receive earlier signals (e.g. from students) that there are reservations about the quality of the educational process before a full cycle of studies is completed, the Act provides the possibility of having the minister responsible for higher education request an immediate assessment of the qualification by the Polish Accreditation Commission. The higher education institution offering the study programme also can request the PAC to conduct such an assessment.
Both the register of study programmes and the current accreditation assessment performed by the PAC are public information, accessible to any interested person.

7.1.5. Criterion 5

Criterion 5. The national quality assurance system for higher education refers to the national framework of qualifications and is consistent with the Berlin Communiqué and any subsequent communiqué agreed by ministers in the Bologna Process.

The national system of quality assurance in higher education in Poland consists of two elements. An essential role is fulfilled by the Polish Accreditation Committee, which performs programme and institutional assessments, mandatory for all higher education institutions in the country. PAC is a member of EQAR, and fully complies with the "European Standards and Guidelines for Quality Assurance for Higher Education", a supplement to the Berlin Communiqué of 2005. The PAC Presidium passed a resolution on November 22, 2011 to add the regulations of the legal acts introducing the qualifications framework for higher education into its quality assurance standards and criteria. General and specific quality assurance criteria include, among others: the recommendation to describe study programmes with the use of learning outcomes; the appropriate referencing of these outcomes to descriptors of the broad areas of study for knowledge, skills and competences, qualifications' framework levels and educational profiles; a presentation of validation methods for the intended learning outcomes; as well as the development of procedures – as part of the higher education institution's internal quality assurance system – for study programme design and implementation monitoring, with the inclusion of external stakeholders and others.
The second component of the external quality assurance system is the Academic Accreditation Committee established at the initiative of higher education institutions, which cooperates with the Conference of Rectors of Academic Schools in Poland. This committee offers a voluntary

assessment of the quality of higher education units. Work on adapting accreditation standards to the qualifications framework for higher education is still proceeding.

7.1.6. Criterion 6

Criterion 6. The national framework, and any alignment with the European framework, is referenced in all Diploma Supplements.

Each graduate of a Polish higher education institution receives a supplement to his/her diploma. This supplement fully complies with the relevant European regulations.

7.1.7. Criterion 7

Criterion 7. The responsibilities of the domestic parties to the national framework are clearly determined and published.

Due to the fact that the qualifications framework for higher education was introduced as a legal act, all higher education institutions are required to implement it. The scope of these obligations is defined in the regulations.

7.2. Procedures for verifying the alignment of national frameworks and the Qualifications Framework of the European Higher Education Area

7.2.1. Procedure 1

Procedure 1. The competent national body/bodies shall certify the compatibility of the national framework with the European framework.

The Steering Committee for the National Qualifications Framework acknowledged the compatibility of the National Qualifications Framework for Higher Education with the proposed Polish Qualifications Framework under preparation, as well as its alignment with the European Qualifications Framework by approving a resolution to this effect on December 19, 2012. This decision was the basis for preparing later legislation on the National Qualifications Framework for Higher Education.

7.2.2. Procedure 2

Procedure 2. The self-certification process shall include the stated agreement of the quality assurance bodies in the country in question, recognised through the Bologna Process.

The Polish Accreditation Committee is required to perform a qualitative assessment of how higher education institutions are implementing educational regulations. Amendments to the Act – Law on Higher Education of March 2011 required that the PAC include the process of implementing the National Qualifications Framework for Higher Education in its assessments of higher education institutions. The PAC is a member of the European Register of Quality Assurance Agencies, which means that it complies with the "European Standards and Guidelines for Quality Assurance for Higher Education". The PAC fulfilled this task by adopting appropriate resolutions.[54]

[54] Resolution no. 961/2011 of the Presidium of the Polish Accreditation Committee of 24 November 2011 on the principles of conducting a site visit during programme assessment; Resolution no. 962/2011 of the Presidium of the Polish Accreditation Committee of 24 November 2011 on the principles of conducting a site visit during institutional assessment.

7.2.3. Procedure 3

Procedure 3. The self-certification process shall involve international experts.

The internationalisation of the self-certification process occurred in two ways.
First, the process of self-certifying the National Qualifications Framework for Higher Education in Poland is part of the process of preparing the Polish referencing report. The team preparing the main referencing report includes four international experts from Scotland, Germany, Hungary and Austria (see Part 6.7 of this report). Parts of the report on levels 6–8 were presented and discussed at the meetings (seminars) of the team, at the same time other levels of the EQF were being considered.
Second, the team for the self-certification process prepared a separate report for higher education, while maintaining consistency with the main referencing report. This report was discussed with additional international experts associated with higher education.
Additionally, the Polish experiences of introducing the qualifications framework for higher education have been presented at many conferences and other international forums. Among them, for example, are the annual international conferences on the topic of qualifications frameworks held since 2009 in November in Warsaw, ETF organised seminars and conferences and other forums.

7.2.4. Procedure 4

Procedure 4. The self-certification and the evidence supporting it shall be published and shall address separately each of the criteria set out.

The Self-certification Report will be part of the main referencing report of the Polish Qualifications Framework and they will be published together as required by the EQF Advisory Group.

7.2.5. Procedure 5

Procedure 5. The ENIC and NARIC networks shall maintain a public listing of States that have confirmed that they have completed the self-certification process.

Currently, information on this topic is available at the National Coordination Point and the Ministry of Science and Higher Education and has the status of public information, which means that any interested person can access it.

7.2.6. Procedure 6

Procedure 6. The completion of the self-certification process shall be noted on Diploma Supplements issued subsequently by showing the link between the national framework and the European framework.

Immediately after the self-certification process is completed, this information will be included in diploma supplements as ordered by a decision of the minister responsible for higher education.

Part 8. The results of implementing the National Qualifications Framework for Higher Education

8.1. Changes in higher education institutions and how they are monitored

With the 2012/13 academic year, Polish higher education institutions admitted their first class of students who will earn a degree under the new regulations implementing the NQF for Higher Education. These institutions carried out a tremendous amount of work in the spring and summer to analyse the study programmes offered from the perspective of the programme autonomy they have gained and to describe these programmes' intended learning outcomes for knowledge, skills and social competences. This work was carried out by dedicated teams, both at the higher education institution level, as well as by individual organisational units offering courses of study. The descriptions prepared by these teams were the subject of discussion in the academic community, and were accepted in the form of resolutions by faculty councils and university senates.

This work constituted the first step in the process of re-orienting the educational process and internal quality assurance systems, of which an essential component is verifying whether and to what extent the intended learning outcomes for study programmes and individual courses / modules are being achieved by students. The results of these analyses will be the subject of regular reviews by the bodies governing the higher education institution and its organisational units responsible for the educational process. The new regulations require the director of the organisational unit offering a study programme (dean) to submit a report on, among other things, the assessment of learning outcomes to the council of the unit (faculty council) on an annual basis.

The increased autonomy of universities has resulted in the development of many new, interesting study programmes, which meet the needs of the Polish labour market to a large extent.

On June 21, 2012, the Ministry of Science and Higher Education announced a funding competition open to higher education organisational units on using the NQF-HE to implement educational quality improvement systems. The units entering the competition presented the changes developed as a result of NQF-HE implementation, which are leading to an improved quality of education. An overview of competition entries shows that the direction of the changes being implemented is consistent with the premises of the NQF-HE. From among over 200 competitors, the jury selected 62 best programmes; they each were awarded additional funds in the amount of 1 million złotys (about 250 000 euro).

Also, in the summer of 2012 the Polish Rectors Foundation – with stakeholders' support – initiated a project to monitor the activities of higher education institutions in the process of implementing the NQF-HE.

8.2. Changes in other institutions associated with higher education

The Polish Accreditation Committee, defined in the Act – Law on Higher Education as an independent institution working to improve the quality of education, undertook an autonomous process of preparing for the changes resulting from NQF-HE implementation. As a result of these changes, the operation of internal quality assurance systems and their effectiveness in improving the educational process became the focus of assessment, based on a reliable comparative analysis of intended learning outcomes with those actually achieved by students. The first decisions of PAC, based on assessments carried out in this way, will be made starting in 2015, when the first graduates of cycle 1 studies conducted according to the national qualifications framework will be leaving university.

Prior to this date, activities are planned to inform higher education institutions about the new accreditation mechanisms.
PAC conducts programme and institutional assessments. It provides the minister responsible for higher education with opinions and conclusions on such matters as: the establishment of new higher education institutions and granting these institutions the right to educate, renewing permission for the operation of private higher education institutions and restoring privileges to educate in a particular field of study.

In accordance with its already approved resolutions, the Polish Accreditation Committee evaluates the quality of education by verifying:
– whether the learning outcomes defined by the higher education institution for a given study programme are consistent with the descriptors for the given broad area of study in the national qualifications framework for higher education,
– whether the educational process actually enables these outcomes to be achieved,
– the manner of validating learning outcomes.

The institutional procedures evaluated include:
– the operation and improvement of internal quality assurance systems for education,
– the accreditation or certification of international institutions obtained by the faculty or organisational unit of a higher education institution,
– the results of the programme assessment.

The assessment procedure conducted by PAC is free of charge, compulsory and cyclical. As a result of a negative assessment, the minister responsible for higher education revokes or suspends the ability of the institution or unit to provide higher education.
An important entity in the system of higher education is the Polish Council for Science and Higher Education. The Act – Law on Higher Education entrusted the Council with an important role in implementing the National Qualifications Framework for Higher Education. The Council may recommend to the minister responsible for higher education the best designed and functioning study programmes. The learning outcomes of the recommended programmes will be published in a ministerial resolution as exemplary descriptions of learning outcomes and should serve as models of good practice for other higher education institutions.

8.3. Difficulties and barriers, challenges and perspectives

A basic condition for achieving the full benefits of NQF-HE implementation is the effective operation of the quality assurance systems in Polish higher education institutions. In referring to the comparative analyses of intended learning outcomes with those actually achieved, the system must propose solutions to effectively reduce identified gaps and to convince the more conservative academics of the need for these changes. Although Polish academia is, as a whole, convinced about the benefits of implementing the NQF-HE, which was evidenced in their strong support of the strategic documents and their unanimous proposal of implementation, persons who are sceptical or even reluctant to change their thinking about how to effectively educate are surely not lacking here.
Implementing necessary changes will be needed in many faculties and fields of study, where the former, elitist character of education still dominates, but is no longer justified given the significant increase in the numbers of diversely talented young people embarking on studies. The initial period will be the most difficult, because the benefits brought by changes in the didactic process can only be seen after some time. Improving education becomes much easier when the first graduates taught in the new style will find themselves in the labour market and the higher

education institutions that genuinely implemented the changes begin receiving feedback on students' increased satisfaction with their studies. This will be a powerful mechanism supporting improvement of the educational process in all higher education institutions, especially in the face of an ever more careful selection of study programmes by the unfortunately declining (for demographic reasons) cohort of candidates from year to year. The Act – Law on Higher Education requires higher education institutions to monitor the careers of its graduates, which will surely strengthen the impact of this mechanism on the activities carried out in these institutions.

One significant change related to introducing the NQF-HE is educational profiling – the entity conducting a study programme must decide whether it has an academic or practical profile, define learning outcomes accordingly and determine how to implement the programme (practitioners must be included in the implementation of a practically profiled programme). It is currently difficult to assess whether and how higher education institutions will take advantage of this opportunity.

Part 9. Further work

9.1. Implementing the final stages of the scenario

The key to achieving relevant results and benefits from the implementation of the National Qualifications Framework for Higher Education is the harmonious cooperation of all parties involved in the process. The way this process has occurred so far instils optimism for the future.

First, the Ministry of Science and Higher Education, with the legal authority to oversee and take responsibility for the qualifications available from the higher education system, is constantly monitoring the effects stemming from the law. A specially appointed expert group to the Minister of Science and Higher Education gathers and analyses comments from stakeholders of the process. An important source of information is the NQF-HE tab at the Ministry's website, where questions can be asked about the interpretation of various provisions of the law implementing the NQF-HE. Information is also provided about planned meetings and conferences on qualifications frameworks. Ministry representatives participate in all meetings of the two associations of rectors established by law: the Conference of Rectors of Academic Schools in Poland and the Rectors of Polish Vocational Schools, as well as sector associations (conferences of university rectors, technical schools, fine arts schools) and gather comments on the implementation of the NQF-HE. The conclusions of all these analyses will be the basis for improving the law to make the process, so important for the entire system of higher education, easier and as free of bureaucracy as possible.

Second, the Polish Accreditation Committee is urgently analysing how its procedures for assessing the quality of education are functioning under this changed paradigm. With each subsequent site visit, self-assessment report and accreditation decision made, experiences are being gained. Additionally, there have already been (and are planned in the future) meetings of the PAC leadership with the team of experts at the Ministry to exchange information about the signals coming from higher education institutions. The resulting body of knowledge will be used by PAC to improve its regulations and procedures.

Third, the Students' Parliament of the Republic of Poland – which statutorily represents Polish students, and the National Representation of Doctoral Students, also established by law, actively support the implementation of the National Qualifications Framework, rightly recognising that implementing it well is in the best interest of Polish students and doctoral candidates. Both these organisations have been very consistent in their position, noted already during work on amending the Act to include the framework in the Polish legal system, when the Students' Parliament and the doctoral students ardently advocated for the proposed changes. The involvement of undergraduate and graduate students is particularly visible at the level of higher education faculties that have taken advantage of the flexibility gained under the new legal situation to modify or create entirely new courses of study.

Fourth, we also see increased interest in cooperation with the labour market, especially at vocational higher education institutions. The demographic forecast for Poland unfortunately predicts many years of decline in the number of future students. Thus, students will have ever greater choices of where to study and they will decide based on future opportunities in the labour market after graduation. Higher education managers are becoming increasingly aware that good cooperation with the labour market is a convincing argument for attracting future students.

Fifth and finally, optimism is instilled by the dynamism manifested in many higher education institutions after they gained autonomy over study programmes. New, well-designed and quite interesting (also from the point of view of the labour market) study programmes emerged very quickly. The dynamics of this change is very promising given that we are still only at the beginning of the road. The development of high-quality study programmes will spread throughout the entire system, as the result of the clause in the Act that the Council for Science and Higher Education can recommend the best study programmes to the minister responsible for higher education, who can promote them by inclusion in the set of model learning outcomes.

Implementing the NQF-HE in accordance with the recommendations of the European Parliament and the Bologna Process means that work needs to be undertaken on some of its additional elements. These include the EQF level 5 and validating learning outcomes acquired outside of formal education. Work is currently underway on these issues. Some of the proposed solutions have already found their way into the proposals for the next amendments to the Act – Law on Higher Education.

9.2. The fifth level of the Polish Qualifications Framework

As already stated in the Part 2 of this document, the National Qualifications Framework for Higher Education is not only to be a description of the current state of the higher education system in Poland, but also an important tool to reform the entire qualifications system.

For this reason, the authors of the concept of the Polish Qualifications Framework, integrating the National Qualifications Framework for Higher Education, after extensive, in-depth consultations with all stakeholders, recognised that the PQF should take into account level 5 qualifications. This would include not only present qualifications comprehensively meeting the requirements described by PQF level 5 descriptors, but also as yet nonexistent qualifications awarded upon completion of a study programme offered by a higher education institutions that is not a level 6 qualification. The PQF level 5 descriptors defined during the preparation of the national qualifications system are consistent with the level 5 descriptors of the European Qualifications Framework.

Among the currently awarded qualifications in Poland, the ones assigned to level 5 will include those whose access is contingent on receiving the *matura* certificate (i.e., level 4 qualifications), such as, for example, diplomas and certificates awarded at post-*matura*, general post-upper secondary, technical post-upper secondary and post-master's degree schools, colleges, learning centres and other educational institutions. Whether a given qualification can be assigned to PQF level 5 should be decided by the institution operating the qualifications register, after having analysed the compatibility of intended learning outcomes for the proposed qualification with those defined for PQF level 5.

In the future, level 5 could also include appropriate qualifications awarded by higher education institutions as is the case in other European countries (Kirsch, Beernaert, 2011).

The concept of providing an education in a higher education institution that concludes at PQF level 5 is motivated by an analysis of the practice and experiences gained in this field in Europe and the United States, as well as the expectations of stakeholders and the labour market.

It seems that economic, social and political arguments also speak for implementing an educational option in higher education that will enable the achievement of an intermediate qualification between levels 4 and 6, allowing later learning to continue in the higher education system or entry into the labour market. Such an approach is consistent with the definition of education in the higher education short cycle presented in the 2003 publication of the European Association of Institutions in Higher Education (EURASHE) (Kirsch, Beernaert, 2003, p. 8).

There are important reasons for introducing education leading to level 5 qualifications. First, with the already high (more than 50% of the cohort) and still growing demand for higher education, some persons undertaking studies in the future will not be able to meet the requirements of a qualification at level 6. Second, international forecasts show that the need for persons with qualifications at level 6 and above will not exceed 50%, but there is demand for people with skills equivalent to a qualification at level 5. Under these conditions, the current education model will lead to a structural mismatch between the qualification level of educated persons, labour market needs and an inability of finding work equivalent to one's achieved qualification level (this is seen today in the case of graduates who have completed some study programmes).

This issue, however, requires further in-depth analyses and good preparation. Therefore, at this stage, Poland does not offer qualifications at level 5 in the higher education system.

9.3. Validating learning outcomes acquired outside of the higher education system

The system of higher education in Poland currently lacks systemic solutions enabling a significant scale of validating and recognising learning outcomes achieved through non-formal education and informal learning. The current law provides higher education institutions the possibility of performing such validation, but practices in this area have resulted in relatively little experience. Examples of solutions used by individual institutions exist, but they are usually limited to single cases of recognising learning outcomes acquired outside of higher education to shorten the term of study and award the qualification in less time than is prescribed by the study program.

In preparing for the implementation of systemic solutions, research is being conducted on practices used in Poland and the systemic solutions applied in other countries. An example is the study "Confirming learning outcomes in higher education institutions", conducted by the Educational Research Institute in the systemic project "The development of terms of reference for the implementation of the National Qualifications Framework and the National Qualifications Register for lifelong learning".[55]

At the moment, the initial assumptions are being developed for systemic solutions of validating and certifying learning outcomes in the higher education system. The following organisational premises are being considered:

1. The process of validating learning outcomes will be carried out by specialised units of higher education institutions.
2. These units will also provide advice services to learners to help them identify and document the learning outcomes they have attained. Validation will be performed of attained learning outcomes and a document will be issued certifying the results. The document certifying the learning outcomes will include their detailed description, as well as a description of the methodology and scope of the validation process.
3. These units will be required to have their own quality assurance system for the validation process and will be subject to periodic external assessments by the Polish Accreditation Committee.
4. The certification of learning outcomes by a validation centre of one higher education institution will be able to be recognised by a different HEI in Poland, but the decision on whether or not to accept or reject certification will be made autonomously by the higher education institution admitting the learner.
5. Certified learning outcomes will be able to be used by learners in study programmes and postgraduate programmes and all training that leads to the awarding of a qualification.
6. If all the learning outcomes required for a qualification become certified as a result of the validation process, the higher education institution may award this qualification – a diploma for first or second cycle studies.
7. An advisory office will be established at the national level to audit learning outcomes when a learner is unable to find an appropriate validation unit. As a result of the audit, the learner will be directed to the proper validation unit for the scope of learning outcomes in question.

This system will be implemented in many stages and supported by an exchange of experiences among individual validation centres. Preparing this system will require time, but it is undoubtedly a very important task that must be carefully prepared.

[55] This project was implemented at the Educational Research Institute from July 2010 to the end of 2013 (Human Capital Operational Programme, Priority III, Measure 3.4., Sub-measure 3.4.1).

Part 10. The opinions of foreign experts

10.1. The opinion of Prof. Mile Dželalija

Review of the Self-Certification Report of the National Qualifications Framework for Higher Education in Poland

Prof. Mile Dželalija, Ph.D.[56]
University of Split, Split, Croatia

1. Introduction

The Self-certification Report verifies the compatibility of the National Qualifications Framework for Higher Education in Poland with the Qualifications Framework of the European Higher Education Area (QF-EHEA) and with the European Qualifications Framework for Lifelong Learning (EQF-LLL). The report presents the existing higher education system in Poland and very detailed description of all stakeholders' work and involvement during the development of the National Qualifications Framework for Higher Education in Poland. Moreover, the report gives detailed background of the fulfilment and response to the EQF-LLL and the QF-EHEA criteria and procedures, demonstrating that the National Qualifications Framework for Higher Education in Poland is compatible with both overarching frameworks – the QF-EHEA and the EQF-LLL.

2. Higher education system and the framework

In the last years, the Higher Education system in Poland has undergone a dramatic increase in the number of students. At the beginning of the 1990s, the number of students in Polish universities was about 400 000, but today it reaches – 2 million. The Self-certification Report stresses several expectations related to the implementation of the NQF for Higher Education in Poland, from the quality of education and qualifications to better match labour market needs. The Framework in Poland is a tool for reflecting the Higher Education system, and also has become an ideal tool for reform of the system to a changed reality, building the quality and relevance of higher education in Poland.

Level descriptors, as the main elements of the framework, are based on European documents related to qualifications framework and key competences – The Recommendation of the European Parliament and of the Council on Key competences for LLL; the European Qualifications Framework for LLL; and Dublin descriptors.

3. Work during the development and implementation of the NQF for Higher Education in Poland

The Self-certification Report presents detailed phases during the design and implementation of the Framework in Poland. The consultation that has been undertaken in the process has been very extensive, involving all key stakeholders and building clear ownership of the framework to ensure later better implementation. The work has been very extensive and detailed, from the decision, defining objectives and outcomes, organisation of the work, consultation with stakeholders up to self-certification and implementation. Also, coherence with the work on the comprehensive NQF, specifically cooperation with the sector of formal general and vocational education and training, has been ensured. Development of all level descriptors within the Polish Qualifications Framework, for higher education, general education and vocational education and training, were developed by using the same methodology (but, of course, not a part of the Self-certification Report).

4. Legislative changes

The section on legislative changes in the Self-certification Report, enabling the adoption of the NQF for Higher Education, describes a clear and stable approach. In particular, the law defines the

[56] E-mail: mile@pmfst.hr. Additional position: President of the Management Board of the National Agency for Science and Higher Education in Croatia.

first, the second, and the third cycle, and implementation of learning outcomes as knowledge, skills and social competences. The law defines also the number of ECTS credits required to the first and second cycle qualifications: at least 180 ECTS for first cycle degrees, at least 90 ECTS for second, and for the long cycle degree – 300 or 360 ECTS credits.
In the Self-certification Report, it is not clear how many ECTS credits are required in total for the first and the second cycle qualifications, at least 270 or 300 ECTS credits, *and, if possible*:

- *an additional short explanation would be helpful for readers regarding the total number of credits for second cycle.*

The involvement of the entire academic community was clearly described and successfully achieved.

5. Presentation of the NQF for Higher Education

The section of the Self-certification Report on the presentation of the NQF for Higher Education, clearly describes the NQF-HE as an integral part of the Polish Qualifications Framework (PQF), which will be a key element of the modernised qualifications system in Poland. It will consist of eight levels using learning outcomes with three categories: knowledge, skills and social competences, similar to the EQF.
Within the NQF for Higher Education in Poland, there is an interesting and unique solution in the definition of level descriptors. There are two stages of generic descriptors, which differ in the level of detail of the description and the field of the qualifications. Generic descriptors at the second stage further detail the first stage generic descriptors. This two-stage structure does not exist for third cycle.
The eight broad subject areas are consistent, as identified, with the OECD/EUROSTAT/UNESCO science and technology classification, as follows:

1. humanities,
2. social sciences,
3. exact sciences,
4. life sciences,
5. agricultural sciences,
6. engineering and technology,
7. medical and health sciences, veterinary sciences,
8. fine arts.

There are two additional profiles to all subject areas:

a) academically oriented profile, and
b) practically oriented profile.

It is interesting that the volume of learning outcomes for practically oriented qualifications is generally larger than for academically oriented qualifications (because of additional learning outcomes in the category of skills that can be obtained through work related experience). It is also clearly indicated that the learning outcomes for both profiles are relevant to the labour market needs, and that there are guarantees of no "dead end" learning pathways. It is clear in the report that National Qualifications Register will play an important role in the Quality Assurance system.

6. Referencing the NQF for Higher Education to the PQF

In the Self-certification Report, the section on referencing the NQF for HE to the Polish QF shows the accepted work concept consisting of the implementation of the NQF for Higher Education as a type of pilot project for the implementation of the Polish QF. The concept ensures a coordinated approach to the development of learning outcomes defined for the first and second cycle qualifications in the NQF for Higher Education and the Polish QF descriptors for the 6th and 7th levels.
It is clear that the NQF for Higher Education in Poland was developed as an autonomous part of a larger and coherent Polish QF. For now, only qualifications at levels six, seven and eight are included in the NQF for Higher Education. It is anticipated that new qualifications in Higher Education in Poland may be developed in the future at level five.

7. Referencing the NQF for Higher Education to the EQF

The section on referencing the NQF for Higher Education to the European Qualifications Framework (EQF) clearly presents the fulfilment of the ten referencing criteria of the EQF, ensuring that the referencing process is well understood and trusted by stakeholders.

The consistency between the language, concepts and assumptions in the Polish QF and the EQF is clearly stated.

Table 3 effectively demonstrates this comparability and consistency – *only, if possible, additional short explanation could be helpful for readers:*

- *regarding the "creative work", comparing to the "creative solution" in the EQF (which appears only at level 5). It means that "creative", as a concept, appears in the NQF for Higher Education in Poland as a sub-category, but in the EQF as an expression of complexity within the skill category*;
- *regarding the "unpredictable context" – why it is better to introduce the concept "unpredictable context" at the second stage of descriptors, but not at the first stage*.

8. Referencing the NQF for Higher Education in Poland to the QF-EHEA

The section on fulfilment of the self-referencing criteria and procedures of the QF-EHEA is very clear in the Report. Only, *if possible*:

- *additional short explanation could be helpful for readers regarding the rationale of the usage of ECTS credits to the third cycles in Poland. As stated within the Criterion 3 in the Self-certification Report, ECTS credits must be used also for all third cycle qualifications in Higher Education in Poland;*
- *the statement of the QA body in Higher Education within Procedure 2, could be needed; and*
- *a small technical element – within the subsection on procedures, only the title "Criterion 1–6" should be changed to "Procedures 1–6"*.

9. Effects of implementation and further work

The Self-certification Report further describes the effects of implementation, highlighting the positive effects, difficulties and barriers, and challenges and perspectives. It shows also the further work on the development and implementation, including development of programmes at the level 5, and effective and accessible systems for recognition of prior learning. This would effectively link the Higher Education system to a sustainable model of lifelong learning.

10. Conclusion

The Self-certification Report of the National Qualifications Framework for the Higher Education in Poland is a clear and comprehensive report, with original and interesting elements. Specifically, it is original and interesting with the introduction of two stages of generic and subject dependent descriptors. It verifies compatibility of the National Qualifications Framework for Higher Education in Poland with the Qualifications Framework of the European Higher Education Area and to the European Qualifications Framework for Lifelong Learning.

The report presents the existing Higher Education system in Poland and very detailed description of all stakeholders work during the development of the Qualifications Framework for Higher Education in Poland.

Moreover, the report gives detailed and clear background of the fulfilment and response to the EQF and the QF-EHEA criteria and procedures, demonstrating that the National Qualifications Framework for Higher Education in Poland is compatible with both overarching frameworks, the QF-EHEA and the EQF-LLL.

Tables and examples give additional understanding and value. The need to develop EQF level 5 qualifications as well as the system for recognition of prior learning is acknowledged.

Prof. Dr. Mile Dželalija
January 19, 2013

10.2. The opinion of Prof. Ruth Whittaker

Review of the Self-Certification Report regarding the implementation of the National Qualifications Framework for the Higher Education Area

Prof. Ruth Whittaker
Glasgow Caledonian University, Scotland UK

1. Context of NQF development in Poland

The report successfully highlights the challenges facing Poland as it moves to a system of mass Higher Education and an increasingly diversified student population. The need to address the differing needs, goals, expectations, and motivations as well the different social, economic and educational backgrounds of learners is paramount. The role HE needs to play in a national and global economy is also recognised, as is the opportunity presented by the NQF development to reform the educational system in Poland. The move from state-controlled standardised programmes to greater institutional autonomy to recognise and value diversity in terms of learner profile with a more differentiated higher education offering is also emphasised. The shift in focus from educational process to the achievement of learning outcomes through a more varied approach to learning, teaching and curriculum development is also clear.

The explicit inclusion of social and civic competences to prepare learners "to responsibly assume social roles according to the principles of participation in a developed society" (p. 10) is very interesting, and the challenge will be to ensure a student experience at university, which would extend beyond the formal curriculum, which will enable students to develop these competences. If learning outcomes are to be developed to reflect these competences, the means of recognising and assessing these through formal, as well as non-formal and informal learning need also to be developed by universities.

The need to more explicitly meet the needs of Polish employers in terms of generic and specific graduate attributes and skills more closely aligned to the requirements of the workplace and of particular professions has also been embraced in the approach taken to develop the Polish NQF-HE and reform the HE system. As above, the inclusion of competences such as fluency in foreign languages, autonomy and adaptability, general and social competences, as essential elements of the learning outcomes for each programme will require a broad conception of the "curriculum" to allow the "space" for the development of these skills. Such development is determined as much by *how* people learn, as by *what* they learn.

2. Methodology for developing the NQF

The explicit linking of the steps undertaken in Poland to develop the NQF to those recommended in "A Framework for qualifications of the European Higher Education Area" (2005) provides a clear and logical means of conveying both methodology and outcomes. The consultation that has been undertaken in the development of the NQF for Higher Education has been extensive, involving not only the academic community but a range of key stakeholders. Such consultation is clearly important in establishing engagement and ownership of the framework to ensure its implementation strategy will be "bottom up" as well as "top-down". Unless such engagement is meaningfully achieved, the ambitious goals of the NQF development and HE reform could not be realised.

The section on the cooperation with the sectors of formal general and vocational education and training (page 17, par. 3.3) is particularly interesting. In HE qualification development, the explicit building upon the foundations of general education, as well as the need to develop shared understanding of the curriculum and learning, teaching and assessment systems across the different education-sub systems by educators, is clearly crucial in terms of ensuring an effective transition from school to university. In the Scottish education system, we are endeavouring to build these links and progression pathways between schools, colleges (VET) and universities with systems and

curricula that have been developed discretely rather than jointly. The development of our NQF in Scotland (the Scottish Credit and Qualifications Framework – SCQF) was not linked to a process of educational reform. The SCQF reflected our existing educational system, which had moved to learning outcomes, credit-based model prior to the development of our NQF. The opportunity to build these connections and pathways into the design stage of a new HE system is exciting in terms of enhancing opportunities for access from one part of the system to another. What is unclear in the report is the curriculum alignment between vocational and higher education – certainly the structures seem comparable and in alignment with the NQF. One of the key challenges facing European countries is building progression pathways to advanced levels of degree programme from vocational education programmes (EQF level 5). In Scotland, the government are driving universities to increase articulation between Higher National Certificates and Diplomas in Colleges (SCQF 7/6 – EQF level 5) to levels 2 and 3 (SCQF levels 8 and 9 – EQF level 6) of degree programmes in universities. While the level and amount of credit is comparable, often the curriculum and learning, teaching and assessment methodologies are not, which makes transition to university for learners challenging. This can have a subsequent impact on progression and retention rates. Does the educational reform in Poland provide the opportunity to address this issue of developing seamless pathways from vocational to higher education? While progression pathways will be smoother for school pupils, will they be smoother for adult learners, perhaps in the workplace wishing to build on their vocational qualification through a university degree as part of their personal or career development?

The section on legislative changes enabling the adoption of the NQF for HE (par. 3.6) describes a robust approach to ensuring consistency and parity across the HE sector in the structure design, criteria and quality assurance to be met by all university programmes. The section of the Act which introduces regulations that meet the needs of the labour market is interesting in that it is *legislating* for employer involvement in designing, delivering and evaluating/monitoring programmes. While this is common practice in the UK, beyond the requirements of professionally accredited programmes, there is institutional autonomy regarding the way in which this is achieved. This can lead to inconsistencies in the level of employer engagement in programme design, delivery and quality assurance, but it is widely recognised that this engagement is essential and enhances the relevance of the programme for students, as well as equipping them with the skills and attributes required for a graduate career.

The section on the manner of introducing the NQF into Higher Education (par. 3.7) highlights the extensive and intensive engagement with the university sector in the implementation of the NQF leading to transformational change in HE in terms of the design and delivery of programmes. The successful involvement of the entire academic community was required for this to happen and was clearly successfully achieved.

3. Methodological underpinning of NQF for HE

The approach taken to develop two stages of generic descriptors, in which the second stage descriptors further detail the first generic descriptors, is helpful. This approach should make the articulation between general, vocational and higher education more explicit in terms of the progressive development of knowledge, skills and capacities – in terms of increasing depth and breadth of knowledge and complexity of application as a learner moves from one level to the next. The descriptors at the lower level which relate to the concept of qualification profiling will, as argued, make the NQF-HE easier to use operationally. It is interesting to note that this two-layer structure or descriptions of learning outcomes does not exist for 3rd cycle qualifications which are described solely in the form of EQF level 8 descriptors – this seems reasonable because of the greater autonomy for both the learner and institution in the design of learning outcomes for qualifications at this level which are largely determined by the outcomes of individual research. The example in Annex 3 is useful.

The eight broad areas of study are consistent, as identified, with the OECD/EUROSTAT/UNESCO science and technology classification. The definition of learning outcomes for each area of study to correspond to the description of the higher layer of the NQF for HE is helpful in terms of transparency,

consistency and translation into operational practice. The example provided of Engineering, which illustrates that these learning outcomes are developed in line with international standards for each area of study, is valuable.

The approach of differentiating between more theoretical and more practically orientated studies is interesting. It will be useful to evaluate in the medium to long term if the inclusion of a higher volume of learning outcomes in practically orientated qualifications, which can only be obtained through work-related experience, successfully addresses the issue of parity of esteem from the academic, learner and employer perspectives and whether it will lead to the anticipated shift of perception of "better" graduates from practically orientated programmes. The endeavour in the UK is to build in more work-related learning experiences to *all* programmes, whether humanities and arts, social sciences, as well as programmes in STEM and Health which already have substantial work experience/ clinical practice embedded within them linked to the requirements of professional bodies.

It is clearly indicated that the learning outcomes for both profiles are relevant to the labour market and that there are guarantees of no "dead end" learning pathways. It is emphasised that it is easy to progress to an academically orientated 2nd cycle programme from a practically orientated first cycle programme, but the question is whether this can be done easily vice versa?

The goal of breaching the boundaries between "academic" higher education institutions and "vocational" higher education institutions by enabling both types of institutions to offer both practically and academically orientated programmes will again be welcomed as a means of addressing the parity of esteem issue between institutions as well as between different types of higher education programmes. It will be interesting to see how this develops in terms of whether academic higher education institutions will continue to offer predominantly academically oriented programmes and whether vocational higher education institutions will continue to offer predominantly practically-orientated programmes or whether differences in provision will become more "blurred". The extent to which market forces/student demand will influence this diversification may be a key factor here.

The correspondence of intended learning outcomes to the three layers of specification in terms of universal descriptors for the level of education; corresponding subject area and corresponding profile should facilitate greater mobility between higher education institutions as well greater consistency and transparency in terms of curriculum and standards. This should also support greater equity in terms of access to employment and the development of employability skills for all learners regardless of which university they attend.

It is a thought provoking observation that these regulations, and tight control over programme specification in terms of intended learning outcomes serve to give institutions, greater rather than less autonomy. The rationale for this observation is clear, despite the fact that in other countries, such as the UK, with a tradition of institutional autonomy, would find this approach very prescriptive. It is acknowledged however that the learning outcomes presented in the decree are not obligatory and can be translated and modified as appropriate in line with institutional mission and resources. This will be important in terms of ensuring a diverse and differentiated, rather than homogenised, higher education offering, reflecting the needs and expectations of a more diversified student population. The diagram in Figure 4 clearly illustrates the hierarchy of learning outcomes and the autonomy enabled by institutions in translating the level descriptors specified in the NQF-HE into statements for particular study programmes and the role of the academic community and faculty in determining these. The inclusion of examples with associated study programmes to illustrate the model of development in the annexes will be helpful.

4. Referencing the NQF for HE to the PQF

The strategy to implement the Polish NQF for HE, as a type of pilot project for the implementation of the PQF is clearly outlined, as is the means of ensuring a coordinated approach to the development of learning outcome defined for the first and second cycle qualifications in the NQF-HE and the PQF level 6 and 7 descriptors. The report indicates the way in which the discrepancies thrown up by the analysis which compared the sectoral descriptors of PQF levels 6 and 7 and the learning outcomes

descriptions for the first and second cycle qualifications in higher education have been addressed. The fact that there is currently no HE qualification at EQF level 5 is noted, as is the anticipation that one will be developed. This will provide a necessary bridge for learners, and indeed adult returners between vocational and higher educational qualifications, enabling greater flexibility of pathways in terms of pace and context as individuals move through the PQF.

5. Referencing the NQF for Higher Education to the EQF

The presentation of this section is consistent with other self-referencing reports, using the ten criteria to clearly explain the methodology and outcomes of each stage of the process.

Locating the development of the PQF and the referencing to the EQF within the context of wider policy objectives for lifelong learning in Poland will ensure that issues of mobility, recognition of prior learning and employability are embedded across all sectors in the implementation of the NQF-HE and PQF. The development of the National Qualifications Register for Lifelong Learning alongside the NQF is important, and the capacity to include non-formal learning on the register, such as employer-based or community-based learning and training courses etc., which have been accredited, could potentially be explored. This would extend the notion of Lifelong Learning beyond formal providers and support the bridges and connections that can be made between non-formal and formal learning providers.

The consistency between the language, concepts and assumptions in the PQF and EQF is clearly stated. Table 3 effectively demonstrates this comparability and consistency. The detailed analysis of the consistency between the PQF and EQF is helpful and the use of the three indicators to demonstrate exact or close correspondence, implied correspondence, and additionality of the PQF is helpful and comprehensive. Given that the EQF is intended as a meta-framework and translation device, it is inevitable at the PQF will contain greater detail to enable its strategic and operational use within the Polish educational system.

It is acknowledged that the concept of "unpredictability" is not explicitly addressed in the PQF level descriptors in 6 and 7 and perhaps not sufficiently conveyed by the skill areas being proposed. The implicit inclusion of "unpredictability" in the second stage generic descriptors is noted. It might be helpful to consider a more explicit reference to this aspect, certainly at the level of programme delivery. This demonstrates an advanced level of application of skill or knowledge when an individual is required to respond effectively to unfamiliar or new situations or problems.

It is noted that current research is underway to develop a model for higher education institutions to validate learning outcomes achieved elsewhere. The subsequent section on credit transfer and accumulation suggests that this may be focussed on formal learning achieved at different HE educational providers and not necessarily non-formal learning gained through training courses or learning programmes within the workplace or community, or informal learning gained by individuals through their life and work experiences.

In terms of Quality Assurance, clearly the National Qualifications Register will play an important role, alongside the role of the Polish Accreditation Committee, and the voluntary Academic Accreditation Committee. It may be that an independent body, with representation from PAC, the Ministry of Science and Higher Education, the Academic Accreditation Committee, the wider academic community and other key stakeholder bodies, could perhaps be established to support the implementation of the PQF, along the lines of the SCQF Partnership in Scotland.

6. Analysis of the NQF in fulfilling the referencing criteria and procedures of the QF-EHEA

The consideration of this issue within the context of the criteria and procedures for self-certification is clear and well-considered. It is noted that at present there is no short cycle of education corresponding to EQF level 5 but that, as indicated earlier, this issue is currently being studied. A clear statement of intent to develop educational qualifications at this level, if this is the case, would be helpful.

The requirement by law for all schools to accumulate and transfer credits for students is noted. What is not clear is whether universities are legally required to accept credits from other programmes and

universities as a means of shortening study programmes, or whether while the notion of recognising "general" credit is universally agreed, institutions have autonomy in determining the amount, if any, of specific credit they will recognise within their programmes.

7. The effects of implementation – changes resulting from NQF implementation in the higher education system

The positive changes in higher education institutions that have been driven by NQF implementation are effectively highlighted, linked to greater institutional autonomy and subsequent greater responsiveness to the needs of the Polish labour market, as well as improved quality systems**.** The new role of PAC in assessing the quality of the educational process through an analysis of the extent to which intended learning outcomes are achieved by students provides another layer of quality assurance and enhancement and represents a model that will be of interest to the wider European community.

8. Difficulties and barriers, challenges and perspectives

The challenge of developing solutions to address any identified gaps following assessment of the extent to which intended learning outcomes have been achieved and that of engaging academic staff in a process of change is acknowledged. The NQF implementation provide an opportunity to challenge current learning, teaching and assessment practices, which in itself can be challenging for many academics. Mechanisms for supporting staff, including recognition and reward, will need to be developed alongside university initiatives to review and enhance learning and teaching practices.

9. Further work

The value of targeting learners already in the workplace through vocational higher education that is linked to the needs of the labour market, as well as individual career development within the context of demographic change is highlighted. The development of programmes at EQF level 5 and the development of effective and accessible systems for recognising prior learning, whether prior certificated learning/formal learning or non-formal and informal learning, would support this agenda. This would effectively link the higher education system in Poland to a sustainable model of lifelong learning which provides progression routes for adult learners, as well as students coming directly from general education.

There are a number of organisational models for validating learning outcomes acquired outside of the higher education system. These can include a centralised model, for example through a discrete "validation unit" in institutions or a devolved model where the responsibility of validating learning though prior informal and informal learning is that of the Faculty or Department in which the programme an individual is seeking credit within is located. Both models require clear institutional policy, quality assurance systems, support and guidance for staff, resources for staff and students to support each stage of the process, effective institutional monitoring mechanisms, data capture and analysis. The use of learning technologies to streamline support and assessment processes should also be considered.

The value of the approach taken in terms of the different layers of the level descriptors should facilitate the recognition of learning wherever it occurs, because of the possibility of using higher level descriptors as a higher level conceptualisation of the attributes and competences expected at different levels. This can demonstrate *comparability* of the competences required by an individual in order to successfully enter and progress within a university programme. Seeking an *exact* match between the outcomes of informal learning and programme specific learning outcomes is generally difficult due to the nature and contexts of the different learning processes and experiences. Using learning outcomes which are too specific and too closely tied into the model of formal delivery in the validation of non-formal and informal learning can act as a barrier to further learning, rather than an enabler.

10. Conclusion

The Self-certification Report is clear and comprehensive. It effectively conveys the rationale behind the development and implementation of the NQF for HE and provides a model that will be of interest to the wider European community, in terms of the different layers of level descriptors that provide clear operational as well as strategic guidance to institutions and facilitate learning from a variety of different sources. The role of the Polish accreditation committee in assessing the quality of the educational process through an analysis of the extent to which intended learning outcomes are achieved by students is also an interesting approach. Further details of how this process is undertaken and how this informs a quality enhancement cycle in universities will be valuable. The self-referencing to the EQF demonstrates appropriate comparability between the PQF and the EQF, with useful illustrative tables, and examples throughout. The need to develop EQF level 5 qualifications as well as mechanisms for recognising and validating non-formal and informal learning as part of broader lifelong learning development is acknowledged. There are a wealth of examples and models across Europe related to both developments which will be a useful source of reflection and analysis, in order to develop an approach which suits the needs of the Polish higher education system, the labour market and the student population.

Prof. Ruth Whittaker
January 18, 2013

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Recommendation of the European Parliament and of the Council of 18 June 2009 on the establishment of a European Quality Assurance Reference Framework for Vocational Education and Training (OJ C 155 of 8.07.2009, pp. 1–10).

Annexes

Annex 1. Polish Qualifications Framework descriptors

Table A. Polish Qualifications Framework – universal descriptors for levels 5–8

	Level 5	Level 6	Level 7	Level 8
KNOWLEDGE **a person knows and understands:**	• a broad scope of facts, theories, methods and the dependencies between them • the diverse conditions of conducted activities	• an advanced level of facts, theories, methods and the complex dependencies between them • the diverse, complex conditions of conducted activities	• an in-depth level of selected facts, theories, methods and the complex dependencies between them, also in relationship to other fields • the diverse, complex conditions and axiological context of conducted activities	• the world's scientific and creative achievements and the resulting implications of this for practice
SKILLS **a person is able to:**	• complete tasks without instruction under variable, predictable conditions • solve moderately complex and non-routine problems under variable, predictable conditions • learn autonomously • understand moderately complex statements, formulate moderately complex statements using specialised terminology • understand and formulate very simple statements in a foreign language using specialised terminology	• innovatively complete tasks and resolve problems which are complex and non-routine under variable and not fully predictable conditions • autonomously plan one's lifelong learning • communicate with one's surroundings, substantiate one's position	• complete tasks as well as formulate and solve problems with the use of new knowledge, also from other fields • independently plan one's own lifelong learning and direct others in this area • communicate with various groups of respondents, appropriately substantiate one's position	• analyse and creatively synthesise scientific and creative achievements to identify and solve research problems, as well as those related to innovative and creative activities • contribute new elements to these achievements • independently plan one's own development as well as inspire the development of others • participate in the exchange of experiences and ideas, also in the international community
SOCIAL COMPETENCES **a person is ready to:**	• assume basic professional and social responsibilities, evaluate and interpret them • independently act and cooperate with others under structured conditions, direct a small team under structured conditions • evaluate one's own actions and those of others and the teams one directs; assume responsibility for the results of those actions	• cultivate and disseminate models of good practice in the workplace and beyond • make decisions independently; critically evaluate one's own actions, those of the teams one directs and the organisations in which one participates; assume responsibility for the results of those actions	• establish and develop models of good practice in the environments of work and life • initiate actions, critically assess oneself as well as the teams and organisations in which one participates • lead a group and take responsibility for it	• conduct independent research which contributes to existing scientific and creative achievements • undertake professional and public challenges, taking into consideration their ethical dimension, assume responsibility for their results and develop models of good practice in such situations

Table B. Polish Qualifications Framework – descriptors typical for higher education, levels 5–8

	Level 5	Level 6	Level 7	Level 8
KNOWLEDGE **a person knows and understands:**	• selected concepts from basic general knowledge underpinning a given field and selected concepts from specific knowledge in a given field • basic principles of business activities, as well as the economic, legal and other relevant results of various activities undertaken in a given field • basic social roles of persons with 5th level qualifications in a given field	• on an advanced level – selected facts, theories, methods and the complex connections between them, which form: – the basic general knowledge of an academic discipline comprising its theoretical foundation – detailed knowledge related to selected issues in a given field – the main developmental trends in a given field • fundamental dilemmas of modern civilisation • economic, social, legal and other relevant results of activity in a given field	• on an in-depth level – selected facts, theories, methods and the complex connections between them which form: – advanced general knowledge of an academic discipline comprising its theoretical foundation – structured and theoretically supported knowledge of key issues in a given field – advanced and detailed knowledge related to selected issues in a given field – the main developmental trends in a given field, including those related to other fields • fundamental dilemmas of modern civilisation • economic, social, legal and other relevant conditions of the activities in a given field, including basic concepts and principles of protecting industrial and intellectual property	• global scientific and artistic achievements including: – theoretical foundations of a given field – key general and selected detailed issues in this field – newest developmental trends in a given field – as well as the complex connections between this and other fields • importance and meaning of knowledge in solving cognitive and practical problems at a level enabling the assessment and revision of existing paradigms and – potentially – the creation of new ones • research methodology and the conditions of conducting research
SKILLS **a person is able to:**	• acquire information from properly selected sources and use one's knowledge to solve problems in an innovative way or to perform specialised tasks • skilfully select and use methods and tools to solve problems and perform tasks • use a foreign language at B1+ level of the Common European Framework of Reference for Languages (basic words and expressions used in a given field) • communicate to exchange professional knowledge; competently justify one's point of view • organise one's own work – individually and as part of a team	• apply one's knowledge to solve complex and non-routine problems in an innovative manner or to perform tasks under somewhat unpredictable conditions, especially: – properly select and use methods and tools to solve such problems and perform such tasks – use advanced ICT techniques • use a foreign language at B2 level of the Common European Framework of Reference for Languages • communicate with the professional community to exchange knowledge; take part in debate: – present, assess, discuss various points of view and opinions – justify and competently defend one's point of view – acquire information from properly selected sources in accordance with the appropriate level of knowledge as well as: – assess, critically analyse, select and integrate acquired information – interpret this information and present it – properly draw conclusions • organise one's own work – individually or as part of a team • autonomously plan one's own lifelong learning	• apply one's knowledge – also from other fields – to formulate and solve complex and non-routine problems in an innovative manner or to perform tasks in somewhat unpredictable conditions, especially: – properly select and use methods and tools to solve such problems and perform such tasks – use advanced ICT techniques • critically approach sources of information, acquire information from properly selected sources in accordance with the appropriate level of knowledge, and: – assess, critically analyse, select and integrate acquired information – interpret and present this information in a creative manner – properly draw conclusions • use a foreign language at B2+ level of the Common European Framework of Reference for Languages and at a higher level relating to the terminology used in professional work • communicate with various communities to exchange and disseminate knowledge, using, among other methods, mass media; take part in debate: – present, assess, discuss various points of view and opinions – justify and competently defend one's point of view – achieve compromise – initiate discussion on issues of importance to society	• apply one's knowledge to creatively identify, formulate and solve complex and unusual problems in an innovative manner or to perform research tasks, especially: – define the aim and subject of research, formulate the research hypothesis – interpret information in a creative manner and integrate information from various properly selected sources – choose, develop and assess the utility of research methods, techniques and tools and use them in a creative manner • transfer research results for use in the social and economic spheres • disseminate research results in forums and academic journals, as well as use popular forms, such as, among others, the mass media • interpret the results of the research conducted • use a foreign language at a level that enables participation in the international academic and professional community • plan and conduct research or artistic undertakings individually or as part of a team, also in the international community • autonomously plan one's own development, as well as inspire and organise the development of others • teach/train using modern methods and tools

SOCIAL COMPETENCES **a person is ready to:**	• realistically evaluate one's knowledge and systematically broaden it • critically approach information from various sources • assume roles and fulfil one's social obligations resulting from having been awarded a 5th level qualification in a given field • comply with the ethical principles effective in a given field	• approach one's knowledge critically: – recognise its value in solving cognitive and practical problems – recognise its incompleteness and uncertainty – recognise the need to gain new knowledge • critically make use of mass media • assume roles and fulfil one's social obligations, co-organise activities on behalf of the public good, workplace and social environment • fulfil one's professional role responsibly, exhibit care for the achievements, traditions and values of a given profession, including: – compliance with the ethical principles of the given profession – requiring compliance with these principles in one's professional community – resolving ethical dilemmas • think and act in an enterprising manner	• approach one's knowledge critically: – recognise its value in solving cognitive and practical problems – recognise its changeability and the limitations of its applicability – recognise the need to gain new knowledge • assume roles and fulfil one's social obligations, inspire and organise activities on behalf of the public good, workplace and social environment • fulfil one's professional role responsibly and modify it according to changing social needs • contribute to the achievements, tradition and values of a given profession, develop a culture promoting ethical behaviour in the workplace, including: – upholding a professional ethos – implementing and developing the ethical principles of the profession – requiring compliance with these principles in the team one is directing – resolving ethical dilemmas • assume professional challenges, think and act in an enterprising way	• approach existing knowledge critically • develop knowledge in a given field assume roles and fulfil the social obligations of researchers and artists responsibly, take part and assume leadership in activities on behalf of the public good • protect and develop the ethos of the academic and artistic community, especially: – conduct research and use its results honestly, independently and responsibly – respect the principle of the common ownership of research results while taking into account the principles of protecting intellectual property – implement and develop professional ethics and rules of proper conduct in these communities • recognise new ethical dilemmas and seek their solution

Annex 2. Defining learning outcomes for study programmes based on the level descriptors (learning outcomes) of the NFQ-HE

2.1. First cycle studies in the "electronics" study programme

In the case of first and second cycle qualifications, the learning outcomes of study programmes developed by higher education institutions are based on the level descriptors (learning outcomes) in the National Qualifications Framework for Higher Education. They are described in the Resolution of the Minister for eight broad areas of study and two profiles of education. They further develop PQF second stage level descriptors (typical for higher education), which are – in turn – a more elaborated development of PQF universal descriptors.

This hierarchy of descriptors is illustrated in tables C–E for the example of an *electronics* study programme for a first cycle qualification in the higher education academic profile of the broad area of engineering and technology, leading to a qualification (the professional title) of engineer [*inżynier*] in electronics.

The field of "electronics" is one of the fields for which model learning outcomes were presented in the Resolution of the Minister of Science and Higher Education.[57] In defining its learning outcomes for the study programme for this specific field, a higher education institution may (but is not required to) use these examples of learning outcomes.

Tables C–E present learning outcomes (knowledge, skills, social competences) in the following columns:

– PQF level 6 universal descriptors,
– PQF level 6 second stage generic descriptors typical for higher education,
– a description of the learning outcomes for a first cycle qualification in the higher education academic profile in the broad area of engineering and technology,[58]
– a description of the learning outcomes for a typical first cycle study programme with a general academic profile in the field of "electronics" as described in the ministerial resolution.[59]

[57] Resolution of the Minister of Science and Higher Education of 4 November 2011 on model learning outcomes.

[58] The learning outcomes presented are part of Annex 5 of the Resolution of the Minister of Science and Higher Education of 2 November 2011 on the National Qualifications Framework for Higher Education.

[59] The learning outcomes presented are part of Annex 5 of the Resolution of the Minister of Science and Higher Education of 4 November 2011 on model learning outcomes.

Table C

Qualification of an "engineer [*inżynier*] in electronics" KNOWLEDGE			
PQF universal descriptors (level 6)	**PQF second stage generic descriptors (level 6)**	**PQF third stage generic descriptors (level 6) = descriptors for a first cycle qualification in higher education for an engineering and technology area of study with a general academic profile**	**Sample learning outcomes for the study programme**
A person knows and understands:	**A person knows and understands**:	**A person:**	**A graduate:**
• an advanced level of facts, theories, methods and the complex dependencies between them • the diverse, complex conditions of conducted activities	• an advanced level of facts, theories, methods and the complex dependencies between them, consisting of: – the basic general knowledge of the disciplines constituting the theoretical basis of the field – detailed knowledge relating to selected issues in the field – the main developmental trends in the field • the fundamental dilemmas of modern civilization • the economic, social, legal and other relevant results of activities undertaken in the field • the basic principles of conducting business activities and entrepreneurial development, especially at the individual level	• has knowledge of mathematics, physics, chemistry and other appropriate subjects related to the undertaken field of study, useful in formulating and solving simple assignments related to the studied engineering discipline • has basic knowledge of the spectrum of engineering disciplines related to the relevant discipline of the undertaken field of study • has structured, theoretically-based general knowledge of the key issues characterising the studied engineering discipline • has detailed knowledge of selected issues related to some of the areas of the studied engineering discipline • has basic knowledge of the developmental trends in the studied engineering discipline • has basic knowledge of the lifecycle of technical equipment, facilities and systems • knows the basic methods, techniques, tools and materials used to carry out simple engineering tasks related to the fields and academic disciplines relevant to the undertaken field of study • has the basic knowledge required to understand the social, economic, legal and other non-technical aspects of engineering activities • has basic knowledge of management, including quality management and conducting business activities • knows the general principles of establishing and developing one's own business, drawing on knowledge from the scientific field and academic disciplines relevant to the undertaken field of study • knows and understands the basic concepts and rules of protecting industrial property and copyright; is able to draw on the resources of patent information	• has knowledge of mathematics, consisting of algebra, analysis, probability and elements of discrete and applied mathematics, including the mathematical and numerical methods needed to: – describe and analyse electrical circuits, electronic components, analogue and digital electronic systems, as well as the basic physical phenomena occurring therein – describe and analyse the functioning of electronic systems, including those with programmable components – describe and analyse algorithms for signal processing, including video and audio signals – synthesise electronic components, circuits and systems • has knowledge of physics, consisting of mechanics, thermodynamics, optics, electricity and magnetism, nuclear physics and solid state physics, including the knowledge necessary to understand the basic physical phenomena occurring in electronic components and systems and their environment • has structured and theoretically-based knowledge in the field of photonics, including the knowledge required to understand the physical basis of optical communication systems, optical storage and information processing • has structured and theoretically-based knowledge in electromagnetic fields and waves, including the knowledge needed to understand power generation, wired and wireless transmission and high frequency signal detection • has elementary knowledge of the materials used in the electronics industry • has structured knowledge of computer architecture, in particular, the underlying hardware • has structured knowledge of programming methods and techniques • has detailed knowledge of the architecture and programming of microprocessor systems (high and low level languages) • has elementary knowledge of the architecture of computer systems, networks and operating systems needed to install, operate and maintain IT tools for the simulation and design of electronic components, circuits and systems • has elementary knowledge of the basics of telecommunications, telecommunications systems and networks • has elementary knowledge of telecommunications network devices, including wireless networks and the configuration of these devices in local area networks

Table C – continued

Qualification of an "engineer [*inżynier*] in electronics" KNOWLEDGE			
PQF universal descriptors (level 6)	**PQF second stage generic descriptors (level 6)**	**PQF third stage generic descriptors (level 6) = descriptors for a first cycle qualification in higher education for an engineering and technology area of study with a general academic profile**	**Sample learning outcomes for the study programme**
A person knows and understands:	**A person knows and understands:**	**A person:**	**A graduate:**
			• has elementary knowledge of the basics of control and automation • has structured and theoretically-based knowledge of the principles of the operation of electronic components (including optoelectronic components, power components and sensors), analogue and digital electronic circuits and simple electronic systems • has structured knowledge of electrical circuit theory and the theory and methods of signal processing • has basic knowledge in the field of metrology, knows and understands the methods of measuring and extracting the basic parameters characterising various types of electronic components and systems; knows computational methods and the IT tools needed to analyse the results of an experiment • knows and understands the manufacturing processes of electronic components, integrated circuits and micro-systems • knows and understands the processes of design and construction of simple electronic devices • knows and understands the methodology of designing electronic components, analogue and digital electronic circuits (also in the integrated version) and electronic systems, as well as the methods and techniques used in design, including artificial intelligence; knows the language describing the hardware and computer tools for the design and simulation of circuits and systems • is aware of the current state and newest developmental trends in electronics • has elementary knowledge of the lifecycle of electrical components and systems • has the basic knowledge needed to understand the non-technical aspects of engineering activities; knows the basic principles of occupational health and safety required in the electronics industry • has an elementary knowledge of the protection of intellectual property and patent law • has basic knowledge of management, including quality management and conducting business activities • knows the general principles of establishing and developing one's own business

Table D

Qualification of an "engineer [inżynier] in electronics" SKILLS			
PQF universal descriptors (level 6)	**PQF second stage generic descriptors (level 6)**	**PQF third stage generic descriptors (level 6) = descriptors for a first cycle qualification in higher education for an engineering and technology area of study with a general academic profile**	**Sample learning outcomes for the study programme**
A person is able to:	**A person is able to:**	**A person:**	**A graduate:**
• innovatively complete tasks and resolve problems which are complex and non-routine under variable and not fully predictable conditions • autonomously plan one's lifelong learning • communicate with one's surroundings, substantiate one's position	• use to an advanced degree chosen facts, theories, methods and the complex dependencies between them, consisting of: – the basic general knowledge of the disciplines constituting the theoretical basis of the field – detailed knowledge related to selected issues in the field – the main developmental trends in the field • draw upon knowledge to creatively identify, formulate and innovatively solve complex problems or carry out research activities, especially: – define the aim and subject of research studies, formulate research hypotheses – creatively interpret and integrate information acquired from appropriately chosen sources – assess the usefulness, select, develop research methods, techniques and tools and use them creatively – interpret the results of the research conducted	**(1) General skills (unrelated to the specific engineering study programme)** • is able to obtain information from literature, databases and other appropriately selected sources, in English or other foreign language considered a language of international communication in the given engineering discipline; is able to integrate the information obtained, interpret it as well as draw conclusions, formulate and justify opinions • is able to communicate with others using various techniques in the professional and other environments • is able to prepare a well-documented paper on issues related to the field and academic discipline relevant to the undertaken field of study in Polish and a foreign language • is able to prepare and present an oral presentation on specific issues relating to the studied engineering discipline in Polish • is able to learn autonomously • has language skills in the academic field and disciplines relevant to the undertaken field of study at the B2 level of the Common European Framework of Reference for Languages **(2) Basic engineering skills** • is able to use information and communication technologies relevant to the tasks typical of engineering work • is able to plan and carry out experiments, including measurements and computer simulations, interpret results and draw conclusions • is able to formulate and solve engineering tasks using analytical, simulation and experimental methods • when formulating and solving engineering tasks, is able to perceive their systemic and non-technical aspects • has the preparation required to work in an industrial environment and knows the safety rules associated with this work	• is able to obtain information from literature, databases and other sources; is able to integrate and interpret the information, as well as draw conclusions, formulate and justify opinions • is able to work independently and in a team; is able to estimate the time needed to carry out assigned tasks; is able to develop and implement a work schedule to ensure that deadlines are met • is able to develop the documentation to carry out an engineering task and to prepare a report presenting the results of the task • is able to prepare and present a short presentation on the results of an engineering task • has sufficient knowledge of English to communicate and understand written materials such as datasheets, application notes, manuals for electronic and IT tools and other similar documents • has the skill of educating oneself, especially in order to improve professional competence • is able to use known methods, mathematical models and computer simulations to analyse and evaluate the performance of electronic components, and analogue and digital electronic systems • is able to analyse signals and simple signal processing systems in time and frequency domains using analogue and digital techniques and appropriate hardware and software tools • is able to compare design solutions and electronic components according to prescribed utility and economic criteria (power, speed, cost, etc.) • is able to use correctly chosen development environments, simulators and computer-aided design tools for simulation, design and verification of electronic components and simple electronic systems • is able to use properly chosen methods and equipment to measure the basic parameters characterising components and electronic systems • is able to plan and carry out the simulation and measurement of electrical and optical characteristics, as well as extract the basic parameters characterising materials, components, analogue and digital electronics; is able to present the results in numerical and graphical form, interpret and draw conclusions from the results obtained • is able to design a process to test analogue and digital electronic circuits and simple electronic systems and diagnose any errors that may occur • is able to formulate the specifications for the functions of simple electronic systems, including with the use of hardware description languages

Table D – continued

Qualification of an "engineer [inżynier] in electronics" SKILLS			
PQF universal descriptors (level 6)	**PQF second stage generic descriptors (level 6)**	**PQF third stage generic descriptors (level 6) = descriptors for a first cycle qualification in higher education for an engineering and technology area of study with a general academic profile**	**Sample learning outcomes for the study programme**
A person is able to:	**A person is able to:**	**A person:**	**A graduate:**
	• apply research results to the economic and social spheres • disseminate the results of one's work in professional forums and publications, as well as in popular formats, such as mass media • use a foreign language with sufficient ability to enable participation in international scientific and professional communities • plan and implement individual and team research or creative projects, also in an international environment • autonomously plan one's own development and inspire and organise the development of other persons • teach/train using modern methods and tools	• is able to make a preliminary economic analysis of the engineering activities undertaken **(3) Skills directly related to performing engineering tasks** • is able to critically analyse and assess existing technology, in particular equipment, facilities, systems, processes, services, especially in conjunction with the studied engineering discipline • is able to identify and formulate the specifications of simple, practical engineering tasks characteristic of the studied engineering discipline • is able to assess the usefulness of routine methods and tools to solve simple, practical engineering tasks characteristic of the studied engineering discipline and to select and apply the correct method and tools • is able to design and implement a simple device, object, system or process according to preset specifications characteristic of the studied engineering discipline, using appropriate methods, techniques and tools	• is able to design electronic components, analogue and digital circuits (including integrated circuits) and electronic systems, while taking into account the assigned utility and economic criteria, using the proper methods, techniques and tools • is able to design simple circuits and electronic systems for a variety of applications, including simple digital signal processing systems • is able to use catalogues and application notes to choose the appropriate components for a proposed circuit or electronic system • is able to design a simple printed circuit board using specialised software • is able to plan the process of making a simple electronic device; is able to provide an initial estimate of its cost • is able to build, run and test a designed circuit or simple electronic system • is able to configure communications devices in local (wire and wireless) telecommunications networks • is able to formulate algorithms, use high and low level programming languages and the proper IT tools to develop computer programs to operate electronic systems and program the microcontroller or microprocessor drivers of the electronic system • in formulating and solving the tasks of designing elements, electronic circuits and systems, is able to perceive their non-technical aspects, including environmental, economic and legal issues • applies the principles of occupational health and safety • is able to assess the usefulness of routine methods and tools to solve simple engineering tasks that are typical for electronics and select and use appropriate methods and tools

Table E

Qualification of an "engineer [inżynier] in electronics" SOCIAL COMPETENCE			
PQF universal descriptors (level 6)	**PQF second stage generic descriptors (level 6)**	**PQF third stage generic descriptors (level 6) = descriptors for a first cycle qualification in higher education for an engineering and technology area of study with a general academic profile**	**Sample learning outcomes for the study programme**
A person is ready to:	**A person is ready to:**	**A person:**	**A graduate:**
• cultivate and disseminate models of good practice in the workplace and beyond • make decisions independently; critically evaluate one's own actions, those of the team one directs and the organisations in which one participates; assume responsibility for the results of those actions	• critically assess one's level of knowledge: – acknowledge its value in solving cognitive and practical problems – acknowledge gaps and uncertainties in one's level of knowledge – acknowledge the need to gain new knowledge • assume the roles and fulfil social obligations, co-organise activities in the public interest and in work and social environments • responsibly fulfil professional roles and respect the heritage, traditions and values of one's profession, including: – following its ethical principles – complying with its ethical principles in the community – resolving ethical dilemmas • think and act in an entrepreneurial manner • appropriately use mass media resources	• understands the need for lifelong learning; is able to inspire others to learn and to organise learning opportunities for them • is aware of and understands the importance and impact of the non-technical aspects and effects of engineering, including its impact on the environment, and consequently the responsibility for the decisions made in this respect • is able to work in a group, taking on different roles • is able to appropriately prioritise the implementation of tasks specified personally or by others • properly identifies and resolves dilemmas associated with the pursuit of one's profession • is able to think and act in an entrepreneurial manner • is aware of the social role of a technical college graduate, and especially understands the need to formulate and communicate information and opinions on technical achievements and other aspects of engineering to the public – among other means, through the mass media; shall endeavour to provide such information and opinions in a manner that is understandable to the general public	• understands the need and knows of the opportunities for continuous training (second and third cycle studies, postgraduate courses) and improving professional, personal and social skills • is aware of the importance and understands the non-technical aspects and impact of the work of an engineer in electronics, including the impact on the environment, and consequently the responsibility for decisions made in this field • is aware of the importance of behaving in a professional manner, complying with professional ethics and respecting diverse views and cultures • has a sense of responsibility for his/her work and is ready to comply with the principles of teamwork and share responsibility for jointly implemented tasks • is able to think and act in an entrepreneurial manner • is aware of the social role of a technical higher education institution graduate, and especially understands the need to formulate and communicate information and opinions on the achievements of electronics and other aspects of electrical engineering to the public, among other ways, through the mass media; shall endeavour to provide such information and opinions in a manner that is understandable to the general public

2.2. Multiple broad areas of study, first cycle studies with a general academic and practical profile in the study programme of "design"

The learning outcomes in the study programme of "design" presented in Table F refer to three broad areas of study. To indicate differences in the right column of the table (references to the learning outcomes of a particular broad area of study):

– the colour black is used to present the learning outcomes of the social sciences broad area of study,
– the colour green is used to present the learning outcomes of the humanities broad area of study,
– the colour blue is used to present the learning outcomes of the fine arts broad area of study.

The field of "design" has a general academic profile (in the broad area of study in the fine arts) and a practical profile (in the humanities and social sciences).

Table F. Learning outcomes of first cycle studies in the study programme of "design"

Learning outcomes of the study programme	References to the learning outcomes in the fine arts, humanities and social sciences broad areas of study
KNOWLEDGE	
A graduate:	**A person:**
has knowledge of art history, design and culture, as well as foundation knowledge in the fields of philosophy, anthropology, sociology and psychology, considered as specific "tools" for practical use	• has basic knowledge of the nature of the social sciences, their place in the system of science and relationship to other sciences • has structured, basic knowledge of the scientific fields and disciplines relevant to the undertaken field of study, focused on practical applications in cultural, media, promotional and advertising activities of the chosen field • exhibits knowledge about the styles in art and their related artistic traditions
understands the specific place of "design" in the fine arts, with particular consideration of its humanistic and social contexts	• has basic knowledge of the common types of social structures and institutions (cultural, political, legal and economic), and in particular, of their basic elements • has basic knowledge about the relationship between social structures and institutions and their elements • has structured, basic knowledge of the scientific fields and disciplines relevant to the undertaken field of study, focused on practical applications in cultural, media, promotional and advertising activities of the chosen field • knows the basic terminology of the scientific fields and disciplines relevant to the undertaken field of study, and of the cultural, media, promotional and advertising activities related to the chosen field • knows and understands the basic directions of development in the history of specific artistic disciplines and knows the publications devoted to these issues
has mastered knowledge on historic and modern design and is able to confront this with knowledge from the humanities (philosophy, anthropology) and social sciences (sociology, psychology)	• has knowledge about humans, especially as constituents of social structures and the principles of their functioning, as well as their actions within these structures • knows the methods and tools, including data collection techniques used in the scientific fields and disciplines related to the undertaken field of study, enabling the social structures and institutions to be described, as well as the processes occurring within them and between them, with particular consideration of selected social or economic institutions and organizations • has structured, basic knowledge of the scientific fields and disciplines relevant to the undertaken field of study, focused on practical applications in cultural, media, promotional and advertising activities of the chosen field • knows the basic terminology of the scientific fields and disciplines relevant to the undertaken field of study, and of the cultural, media, promotional and advertising activities related to the chosen field of study • exhibits knowledge about the styles in art and their related artistic traditions

Learning outcomes of the study programme	References to the learning outcomes in the fine arts, humanities and social sciences broad areas of study
understands the problems of designing in the modern world and is able to consider these issues in a broader social context as part of the cultural system, media and economy	• knows the processes of change of selected social structures and institutions and their components; knows the causes, process, scale and consequences of these changes • has basic knowledge about the audience of cultural, media, promotional and advertising activities, and basic knowledge of the methods of diagnosing their needs and assessing the quality of services • exhibits knowledge about the styles in art and their related artistic traditions • knows the relationship and dependencies between the theoretical and practical elements associated with the undertaken field of study
exhibits knowledge of the overlapping processes in culture and the arts	• knows the processes of change of selected social structures and institutions and their components; knows the causes, process, scale and consequences of these changes • has basic knowledge of the structure and functions of the system of culture and media • exhibits knowledge about the styles in art and their related artistic traditions
understands the basic directions of the historic development of specific design specialties, especially in consideration of their modern exemplifications	• has knowledge about humans, especially as constituents of social structures and the principles of their functioning, as well as their actions within these structures • knows the methods and tools, including data collection techniques used in the scientific fields and disciplines related to the undertaken field of study, enabling the social structures and institutions to be described, as well as the processes occurring within them and between them, with particular consideration of selected social or economic institutions and organisations • has basic knowledge of the structure and functions of the system of culture and media • knows and understands the basic directions of development in the history of specific artistic disciplines and knows the publications devoted to these issues
knows the publications devoted to design and the humanistic-social discourse they present	• knows the types of social ties occurring in the scientific fields and disciplines relevant to the undertaken field of study and the norms governing them • has structured, basic knowledge of the scientific fields and disciplines relevant to the undertaken field of study, focused on practical applications in cultural, media, promotional and advertising activities of the chosen field of study • knows and understands the basic directions of development in the history of specific artistic disciplines and knows the publications devoted to these issues
exhibits knowledge of the styles in design and their related creative traditions	• has a basic knowledge of the common types of social structures and institutions (cultural, political, legal and economic), and in particular, of their basic elements • has structured, basic knowledge of the scientific fields and disciplines relevant to the undertaken field of study, focused on practical applications in cultural, media, promotional and advertising activities of the chosen field of study • knows and understands the basic directions of development in the history of specific artistic disciplines and knows the publications devoted to these issues
has theoretical knowledge about artistic techniques and technologies utilised in design work	• has basic knowledge of creating works of art related to the undertaken field of study and specialisation, as well as knowledge about the means of expression and technical skills of related artistic disciplines
has basic knowledge about the customers of design work, how to diagnose their needs and the quality of services	• has basic knowledge about the audience of cultural, media, promotional and advertising activities, and basic knowledge of the methods of diagnosing their needs and assessing the quality of services • has knowledge of the financial, marketing and legal aspects of the profession of an artist
understands the educational role of design in society	• knows the organisational norms and rules of selected social structures and institutions • knows the processes of change of selected social structures and institutions and their components; knows the causes, process, scale and consequences of these changes • has a basic understanding of the aims, organisation and functioning of institutions associated with the chosen sphere of cultural, media, promotional and advertising activities • has basic knowledge about the audience of cultural, media, promotional and advertising activities, and basic knowledge of the methods of diagnosing their needs and assessing the quality of services • knows the relationship and dependencies between the theoretical and practical elements associated with the undertaken field of study

Learning outcomes of the study programme	References to the learning outcomes in the fine arts, humanities and social sciences broad areas of study
has knowledge about anthropometric and cognitive ergonomics	• has basic knowledge of the nature of the social sciences, their place in the system of science and relationship to other sciences • has structured, basic knowledge of the scientific fields and disciplines relevant to the undertaken field of study, focused on practical applications in cultural, media, promotional and advertising activities of the chosen field • knows the relationship and dependencies between the theoretical and practical elements associated with the undertaken field of study
understands the need for humans to interact with objects and interface, taking into consideration user-centred design	• knows the methods and tools, including data collection techniques used in the scientific fields and disciplines related to the undertaken field of study, enabling the social structures and institutions to be described, as well as the processes occurring within them and between them, with particular consideration of selected social or economic institutions and organizations • knows the relationship and dependencies between the theoretical and practical elements associated with the undertaken field of study
has knowledge about the basics of the psychophysiology and psychology of perceptual processes, with particular emphasis on environmental perception and knows how to use this in design work	• has knowledge about humans, especially as constituents of social structures and the principles of their functioning, as well as their actions within these structures • knows the relationship and dependencies between the theoretical and practical elements associated with the undertaken field of study
understands the specificity of designing for disabled persons and is able to use the rules of universal design	• has knowledge about humans, especially as constituents of social structures and the principles of their functioning, as well as their actions within these structures • has structured, basic knowledge of the scientific fields and disciplines relevant to the undertaken field of study, focused on practical applications in cultural, media, promotional and advertising activities of the chosen field of study • knows the relationship and dependencies between the theoretical and practical elements associated with the undertaken field of study
understands the specificity of designing for children and takes into consideration knowledge from the field of developmental psychology	
knows and understands the anthropological and sociological contexts of modern humanity	
knows the financial, marketing and legal aspects of being a designer, and of industrial and individual copyrights	• has basic knowledge of the nature of the social sciences, their place in the system of science and relationship to other sciences • knows and understands the basic concepts and principles of the protection of industrial property and copyright law • knows and understands the basic concepts and principles of the protection of industrial property and copyright law • has knowledge of the financial, marketing and legal aspects of the profession of an artist
knows the links and dependences between the theoretical and practical aspects of work as a designer	• has basic knowledge of the legal and economic conditions for the functioning of institutions related to the chosen sphere of cultural, media, promotional and advertising activities • knows the relationship and dependencies between the theoretical and practical elements associated with the undertaken field of study
understands market mechanisms and the need for a designer to work with industry	• knows the general principles establishing and developing individual forms of entrepreneurship that use knowledge from the scientific fields and disciplines relevant to the undertaken field of study • knows the relationship and dependencies between the theoretical and practical elements associated with the undertaken field of study

Table F – continued

Learning outcomes of the study programme	References to the learning outcomes in the fine arts, humanities and social sciences broad areas of study
is aware of new trends and styles in modern design	• knows the processes of change of selected social structures and institutions and their components; knows the causes, process, scale and consequences of these changes • has basic knowledge of the legal and economic conditions for the functioning of institutions related to the chosen sphere of cultural, media, promotional and advertising activities • has basic knowledge of creating works of art related to the undertaken field of study and specialisation, as well as knowledge about the means of expression and technical skills of related artistic disciplines • exhibits knowledge about the styles in art and their related artistic traditions
knows the basic issues of communication, taking into consideration visual communication (2D) and interactive design	
knows the modern technologies of production and manufacturing, the ones based on traditional technologies, as well as those using modern information and communications technologies	• knows the specific range of issues related to the technologies used in the given discipline of art (as a whole) and is aware of the technological development associated with the undertaken field of study and specialisation
has broad knowledge about the problems related to the technologies used in specific specialties found in the study of design	
exhibits broad knowledge of materials and construction and technological issues	
has basic knowledge about workplace health and safety related to working in workshops (ceramic, clothing design, metalwork, carpentry and computerised multimedia)	• has basic knowledge of workplace health and safety in institutions associated with the chosen sphere of cultural, media, promotional and advertising activities
SKILLS	
A graduate:	**A person:**
creatively uses art materials in drawing, painting, as well as in spatial and interactive forms	• is able to analyse a proposed solution to a specific problem and appropriately make a decision in this regard; is able to implement the proposed solution • is able to create and implement one's own artistic concept and has the needed skills to do so • is able to purposefully use artistic tools in selected areas of the visual arts • is experienced in realising one's own artistic work based on stylistically varied concepts resulting from the free and independent use of the imagination, intuition and emotion
purposefully uses modern media and new technologies, such as photo, video, film, computer technology, animation, micro-sensors, touch screens and other media in design work and is able to interpret these in relation to the social sciences or humanities	• is able to properly interpret social phenomena (cultural, political, legal, economic) related to the specific field of study undertaken • is able to find, analyse, assess, select and use information utilising a variety of sources and methods • is able to create and implement one's own artistic concept and has the needed skills to do so • is able to purposefully use artistic tools in selected areas of the visual arts • is experienced in realising one's own artistic work based on stylistically varied concepts resulting from the free and independent use of the imagination, intuition and emotion

Table F – continued

Learning outcomes of the study programme	References to the learning outcomes in the fine arts, humanities and social sciences broad areas of study
is skilled in spatial modelling: constructs models and quickly constructs prototypes	• is able to purposefully use the proper techniques and technologies in creating artistic works
is skilled in using 3D visualisation with the use of graphics programmes and CAD	• is able to understand and analyse social phenomena • is able to purposefully use the proper techniques and technologies in creating artistic works
knows how to create a graphic presentation and documentation using photographic video, computer, multimedia, and other techniques; is able to observe social phenomena and express them through design projects	• is able to purposefully use the proper techniques and technologies in creating artistic works
proficiently uses drawing skills to make presentational and conceptual drawings, to sketch and present them to the public	• is able to purposefully use the proper techniques and technologies in creating artistic works
is able to make autonomous design decisions / or co-operate in a project team, and also has basic organisational skills to plan and carry out the chosen sphere of activity	• has the basic organisational skills to plan and implement tasks in the chosen sphere of cultural, media, promotional and advertising activities • is able to make autonomous decisions regarding the design and implementation of one's own artistic works • is prepared to act and work together with others in a team
is able to produce innovative and experimental concepts using a variety of design techniques, typical for a particular specialisation	• is able to make autonomous decisions regarding the design and implementation of one's own artistic works
is able to produce a concept and creatively interpret design assumptions	• is able to make autonomous decisions regarding the design and implementation of one's own artistic works • is prepared to act and work together with others in a team
is able to prepare a project presentation, develop a project portfolio and autonomously attain knowledge and develop professional skills	• knows how to autonomously attain knowledge and develop the professional skills related to the chosen sphere of cultural, media, promotional and advertising activities • is able to purposefully use the proper techniques and technologies in creating artistic works • knows how to behave during public presentations of one's achievements
properly assesses a design task and selects appropriate means of expression	• is able to make autonomous decisions regarding the design and implementation of one's own artistic works • knows how to behave during public presentations of one's achievements
has the ability to purposefully use the tools of a design workshop, taking into consideration the specifics of each specialty	• is able to purposefully use artistic tools in selected areas of the visual arts
is able to produce and work in a team of designers, as well as an interdisciplinary team	• is prepared to act and work together with others in a team
is able to choose specialists from related fields to achieve the aims of a design project and is able to autonomously attain knowledge that will enable effective cooperation with the chosen specialists and use the skills gained through professional study	• is able to use attained knowledge, including the skills attained during practical training • autonomously plans and implements routine projects related to the chosen sphere of cultural, media, promotional and advertising activities. • is prepared to act and work together with others in a team

Table F – continued

Learning outcomes of the study programme	References to the learning outcomes in the fine arts, humanities and social sciences broad areas of study
easily communicates (verbally and in writing) about design art and one's own projects, also in a foreign language at the B2 level of the Common European Framework of Reference for Languages	• has language skills in the scientific fields and disciplines relevant to the undertaken field of study that meet the requirements of the B2 level of the Common European Framework of Reference for Languages • has language skills in the scientific fields and disciplines relevant to the undertaken field of study that meet the requirements of the B2 level of the Common European Framework of Reference for Languages • is prepared to act and work together with others in a team • is able to prepare routine written texts and oral presentations on specific issues related to various fields of the visual arts, using basic theoretical formulations and various sources • has language skills in the scientific fields and disciplines relevant to the undertaken field of study that meet the requirements of the B2 level of the Common European Framework of Reference for Languages
applies attained knowledge in the field of cognitive and environmental psychology (particularly relating to colour and light) in designing	• has a broad range of workshop skills enabling the production of one's own artistic ideas • has mastered effective practice techniques to maintain one's artistic skills, enabling continuous development through autonomous work
uses ceramics, paper, fabric, metal, wood and other materials in designing	
takes into account the technological context of designing	
uses methods of design procedures combining functional and ergonomic aspects, as well as construction, technological, aesthetic and market aspects	
has the ability to apply psychological, sociological and anthropological research tools enabling human needs to be properly defined and uses them in practice to define project requirements	• is able to foresee the practical results of specific social processes and phenomena (cultural, political, economic) by using the standard methods and tools for the scientific fields and disciplines relevant to the undertaken field of study • has the basic skills of conducting social research required to diagnose the needs of the audience for cultural, media, promotional and advertising activities • has a broad range of workshop skills enabling the production of one's own artistic ideas
is able to find, analyse, assess, select and use information utilising a variety of sources and methods; is especially able to decode and interpret texts and social behaviours	• is able to properly interpret social phenomena (cultural, political, legal, economic) related to the specific field of study undertaken • is able to use basic theoretical knowledge to specifically describe and practically analyse single social processes and phenomena (cultural, political, legal, economic) related to the undertaken field of study • is able to find, analyse, assess, select and use information utilising a variety of sources and methods • is able to use substantive arguments and the views of other authors, as well as formulate conclusions • is able to prepare routine written texts and oral presentations on specific issues related to various fields of the visual arts, using basic theoretical formulations and various sources

Table F – continued

Learning outcomes of the study programme	References to the learning outcomes in the fine arts, humanities and social sciences broad areas of study
is aware of the role of global processes and is able to critically analyse them and apply them in practice; is highly proficient in using mass communications media (including the Internet), as well as basic knowledge about applying the provisions of the law relating to one's chosen professional work, in particular copyright and the management of intellectual property	• is able to properly analyse the causes and course of selected social processes and phenomena (cultural, political, legal, economic) related to the scientific fields and disciplines relevant to the undertaken field of study • is able to foresee the practical results of specific social processes and phenomena (cultural, political, economic) by using the standard methods and tools for the scientific fields and disciplines relevant to the undertaken field of study • properly uses normative systems and selected norms and regulations (legal, professional, ethical) to solve a specific task in the scientific fields and disciplines relevant to the undertaken field of study • has the basic skills of conducting social research required to diagnose the needs of the audience for cultural, media, promotional and advertising activities • is able to use basic legal regulations related to the institutions associated with the chosen sphere of cultural, media, promotional and advertising activities, especially with regard to copyright and the management of intellectual property
has basic research skills (formulates and analyses research problems, chooses the methods and tools of research, formulates and presents results) to undertake the common tasks/problems of the design process	• is able to properly interpret social phenomena (cultural, political, legal, economic) related to the specific field of study undertaken • is able to understand and analyse social phenomena • is able to find, analyse, assess, select and use information utilising a variety of sources and methods • is able to assess the utility of various methods, procedures, good practices to implement tasks and solve problems related to the chosen sphere of cultural, media, promotional and advertising activities, as well as select and apply the appropriate approach • is able to communicate in Polish and a foreign language with specialists from the scientific fields and disciplines relevant to the undertaken field of study by using various communications channels and techniques
has the ability to write short texts and prepare oral presentations, as well as use the techniques of "storytelling", particularly image messages, speak in front of a camera and with a microphone, debate and discuss, argue, present offers to customers, argue in favour of a proposed solution, etc.	• is able to properly interpret social phenomena (cultural, political, legal, economic) related to the specific field of study undertaken • is able to prepare routine written texts in Polish and a foreign language recognised as essential for the scientific fields and disciplines relevant to the undertaken field of study, on specific issues, using basic theoretical approaches and various sources • is able to prepare oral presentations in Polish and a foreign language on specific issues from the scientific fields and disciplines relevant to the undertaken field of study, using basic theoretical approaches and various sources • is able to prepare routine written texts in Polish and a foreign language recognised as essential for the scientific fields and disciplines relevant to the undertaken field of study, on specific issues, using basic theoretical approaches and various sources • is able to prepare routine written texts in Polish and a foreign language recognised as essential for the scientific fields and disciplines relevant to the undertaken field of study, on specific issues, using basic theoretical approaches and various sources
SOCIAL COMPETENCES	
A graduate:	**A person:**
understands the need for lifelong learning, develops and improves qualifications, constantly supplements knowledge, also in the fields of the humanities and social sciences	• understands the need for lifelong learning • understands the need for lifelong learning • understands the need for lifelong learning

Table F – continued

Learning outcomes of the study programme	References to the learning outcomes in the fine arts, humanities and social sciences broad areas of study
creatively and flexibly responds to changing reality	• knows how to participate in preparing social projects (political, economic, civic), taking into consideration the legal, economic and political aspects • is aware of the responsibility to preserve the cultural heritage of the region, the nation and Europe • is able to effectively use: imagination, intuition, emotion, creative thinking and work while solving problems, flexible thinking, adapt to new and changing circumstances and has the skills of controlling one's behaviour, counteracting fears and stress, as well as meeting the conditions related to public performances or presentations
is able to autonomously collect, analyse and interpret knowledge in various related areas	• is able to supplement and improve attained knowledge and skills • is able to appropriately define the priorities for achieving the tasks performed by oneself or others • autonomously undertakes independent work, exhibiting the skills of collecting, analysing and interpreting information, developing ideas and formulating critical arguments, and also has internal motivation and the skill of organising work
understands the need for independence and teamwork, respects autonomy and competence	• is able to act and work in a group and assume different group roles • is able to act and work in a group and assume different group roles • autonomously undertakes independent work, exhibiting the skills of collecting, analysing and interpreting information, developing ideas and formulating critical arguments, and also has internal motivation and the skill of organising work
exhibits sensitivity to social issues	• knows how to participate in preparing social projects (political, economic, civic), taking into consideration the legal, economic and political aspects • is aware of the responsibility to preserve the cultural heritage of the region, the nation and Europe • is able to effectively use: imagination, intuition, emotion, creative thinking and work while solving problems, flexible thinking, adapt to new and changing circumstances and has the skills of controlling one's behaviour, counteracting fears and stress, as well as meeting the conditions related to public performances or presentations
demonstrates creativity, intuition, ability and adaptability, is flexible, able to control one's behaviour	• is able to act and work in a group and assume different group roles • is able to appropriately define the priorities for achieving the tasks performed by oneself or others • is able to appropriately define the priorities for achieving the tasks performed by oneself or others • is able to effectively use: imagination, intuition, emotion, creative thinking and work while solving problems, flexible thinking, adapt to new and changing circumstances and has the skills of controlling one's behaviour, counteracting fears and stress, as well as meeting the conditions related to public performances or presentations
is able to meet the conditions associated with performing publically and making presentations	• is able to act and work in a group and assume different group roles • is able to act and work in a group and assume different group roles • is able to effectively use: imagination, intuition, emotion, creative thinking and work while solving problems, flexible thinking, adapt to new and changing circumstances and has the skills of controlling one's behaviour, counteracting fears and stress, as well as meeting the conditions related to public performances or presentations
is able to counteract the fears and stress related to working for external customers, as well as the challenges of the creative process	• properly identifies and resolves dilemmas related to practicing one's profession • properly identifies and resolves dilemmas related to practicing one's profession • is able to effectively use: imagination, intuition, emotion, creative thinking and work while solving problems, flexible thinking, adapt to new and changing circumstances and has the skills of controlling one's behaviour, counteracting fears and stress, as well as meeting the conditions related to public performances or presentations
understands the role of constructive criticism	• is able to act and work in a group and assume different group roles • is able to act and work in a group and assume different group roles • has the skill of self-assessment, constructive criticism in relationship to the activities of others, reflects on the social, scientific and ethical aspects of one's own work

Table F – continued

Learning outcomes of the study programme	References to the learning outcomes in the fine arts, humanities and social sciences broad areas of study
is aware of one's own abilities related to self-assessment	• is able to act and work in a group and assume different group roles • is able to act and work in a group and assume different group roles • is able to effectively use: imagination, intuition, emotion, creative thinking and work while solving problems, flexible thinking, adapt to new and changing circumstances and has the skills of controlling one's behaviour, counteracting fears and stress, as well as meeting the conditions related to public performances or presentations
is able to reflect on the social, scientific and ethical aspects of one's own work	• is able to act and work in a group and assume different group roles • is able to act and work in a group and assume different group roles • is able to effectively use: imagination, intuition, emotion, creative thinking and work while solving problems, flexible thinking, adapt to new and changing circumstances and has the skills of controlling one's behaviour, counteracting fears and stress, as well as meeting the conditions related to public performances or presentations
is able to think and act in an entrepreneurial manner using "design" thinking and is able to utilise "design" management	• is able to think and act in an entrepreneurial manner • properly identifies and resolves dilemmas related to practicing one's profession • has the skills of effective communication and living in society, specifically: – teamwork with respect to joint projects and activities, – negotiating and organising, – integrating with other persons during the course of various cultural undertakings, – presenting assignments in an accessible manner – with the use of information technologies • knows and understands the basic concepts and principles of protecting industrial property and copyright
is involved in current professional events, competitions and conferences related to one's field of work	• is able to supplement and improve attained knowledge and skills • participates in cultural life, taking advantage of different media and their various forms • has the skills of effective communication and living in society, specifically: – teamwork with respect to joint projects and activities, – negotiating and organising, – integrating with other persons during the course of various cultural undertakings, – presenting assignments in an accessible manner – with the use of information technologies
promotes the values of social integration and has a sense of responsibility for the preservation of the cultural heritage of the region, the nation and Europe, with an emphasis on the heritage of the functional and design arts	• is able to supplement and improve attained knowledge and skills • is aware of the responsibility to preserve the cultural heritage of the region, the nation and Europe • has the skills of effective communication and living in society, specifically: – teamwork with respect to joint projects and activities, – negotiating and organising, – integrating with other persons during the course of various cultural undertakings, – presenting assignments in an accessible manner – with the use of information technologies
has the ability to communicate effectively in society through the organisation of and participation in cultural events, especially those that promote design	• is able to supplement and improve attained knowledge and skills • participates in cultural life, taking advantage of different media and its various forms • has the skills of effective communication and living in society, specifically: – teamwork with respect to joint projects and activities, – negotiating and organising, – integrating with other persons during the course of various cultural undertakings, – presenting assignments in an accessible manner – with the use of information technologies
demonstrates teamwork skills while undertaking joint projects and activities	
effectively organises the design process and accessibly presents projects using information technology in their presentation	

Table F – continued

Learning outcomes of the study programme	References to the learning outcomes in the fine arts, humanities and social sciences broad areas of study
knows and understands the basic concepts and principles of the protection of industrial property and copyright law	• knows how to participate in preparing social projects (political, economic, civic), taking into consideration the legal, economic and political aspects • properly identifies and resolves dilemmas related to practising one's profession • knows and understands the basic concepts and principles of the protection of industrial property and copyright law

Source: University of Social Sciences and Humanities

2.3. Second cycle studies in the study programme of "mathematics"

Table G. Learning outcomes of second cycle studies with a general academic profile in the study programme of "mathematics"

Model learning outcomes of the study programme	References to the learning outcomes of the exact sciences broad area of study
KNOWLEDGE	
A graduate:	**A person:**
has in-depth knowledge about the fundamental fields of mathematics	• has extensive knowledge of the scientific fields and disciplines relevant to the undertaken field of study, as well as their historical development and significance for the advancement of the exact and life sciences, knowledge of the world and human development
has a good understanding of the role and significance of the structure of mathematical reasoning	• has extensive knowledge of the scientific fields and disciplines relevant to the undertaken field of study, as well as their historical development and significance for the advancement of the exact and life sciences, knowledge of the world and human development • knows experimental, observational and numerical techniques and methods of constructing mathematical models in the undertaken field of study, is able to autonomously replicate basic theorems and laws and the evidence for their proofs
knows the most important theorems and hypotheses of the main fields of mathematics	• has extensive knowledge of the scientific fields and disciplines relevant to the undertaken field of study, as well as their historical development and significance for the advancement of the exact and life sciences, knowledge of the world and human development • has general knowledge of the current directions of development and the newest discoveries in the scientific fields and disciplines relevant to the undertaken field of study
has in-depth knowledge about a chosen field of theoretical or applied mathematics	• has knowledge of mathematics at the level required to quantitatively describe, understand and model problems of an average level of complexity
has in-depth knowledge about a chosen field of mathematics: 1) knows most of the classical definitions and theorems, as well as their proofs	
2) understands the formulation of the problems being studied	• has knowledge of mathematics at the level required to quantitatively describe, understand and model problems of an average level of complexity • has general knowledge of the current directions of development and the newest discoveries in the scientific fields and disciplines relevant to the undertaken field of study
3) knows how one's chosen field of mathematics is connected to other fields of theoretical and applied mathematics	• has knowledge of mathematics at the level required to quantitatively describe, understand and model problems of an average level of complexity
knows advanced computational techniques supporting the work of mathematics and understands their limitations	• knows experimental, observational and numerical techniques and methods of constructing mathematical models in the undertaken field of study, is able to autonomously replicate basic theorems and laws and the evidence for their proofs • knows the theoretical basis of computational methods and computer techniques used to solve routine problems in the scientific fields and disciplines relevant to the undertaken field of study • knows the theories supporting the operation of scientific instruments in the scientific fields and disciplines relevant to the undertaken field of study

Table G – continued

Model learning outcomes of the study programme	References to the learning outcomes of the exact sciences broad area of study
knows the basis of stochastic modelling in financial and actuarial mathematics or the natural sciences, especially physics, chemistry or biology	• knows experimental, observational and numerical techniques and methods of constructing mathematical models in the undertaken field of study, is able to autonomously replicate basic theorems and laws and the evidence for their proofs • knows the theoretical basis of computational methods and computer techniques used to solve routine problems in the scientific fields and disciplines relevant to the undertaken field of study
knows the numerical methods used to find approximate solutions of mathematical problems (e.g., differential equations) posed by the applied field (e.g., industrial technologies, management, etc.)	
knows the mathematical basis of information theory, algorithm and cryptography theory and their practical applications, among others in programming and broadly understood IT	
knows well at least one software package used for symbolic computation and one package for statistical data processing	• knows the theoretical basis of computational methods and computer techniques used to solve routine problems in the scientific fields and disciplines relevant to the undertaken field of study
knows English at a medium-advanced level (B2) and another foreign language at a level enabling the comprehension of professional literature	• has general knowledge of the current directions of development and the newest discoveries in the scientific fields and disciplines relevant to the undertaken field of study • has language skills in the scientific fields and disciplines relevant to the undertaken field of study that meet the requirements of the B2+ level of the Common European Framework of Reference for Languages
knows the principles of workplace health and safety at a level enabling the autonomous practice of work as a mathematician	• knows the principles of workplace health and safety at a level enabling the autonomous practice of work in research or measurement
SKILLS	
A graduate:	**A person:**
is able to use mathematical reasoning: proving theorems and refuting hypotheses through the design and selection of counterexamples	• is able to plan and conduct basic research, experiments or observations on cognitive problems within the scientific fields and disciplines relevant to the undertaken field of study • is able to critically assess the results of experiments, observations and theoretical calculations, as well as discuss measurement errors • is able to present research results in the form of an autonomously prepared discourse (report) containing a description and justification of the work's aim, methodology used, results and their significance in comparison with other similar studies
is able to express mathematical content verbally and in writing, in various types of mathematical texts	• is able to find essential information in the professional literature, data bases and other sources; is familiar with the basic scientific journals for the undertaken field of study • is able to present research results in the form of an autonomously prepared discourse (report) containing a description and justification of the work's aim, methodology used, results and their significance in comparison with other similar studies
is able to validate the inferences in the construction of formal proofs	• is able to plan and conduct basic research, experiments or observations on cognitive problems within the scientific fields and disciplines relevant to the undertaken field of study • is able to critically assess the results of experiments, observations and theoretical calculations, as well as discuss measurement errors

Table G – continued

Model learning outcomes of the study programme	References to the learning outcomes of the exact sciences broad area of study
perceives the formal structures related to fundamental mathematical fields in mathematical problems and understands the importance of their properties	• is able to find essential information in the professional literature, data bases and other sources; is familiar with the basic scientific journals for the undertaken field of study
is able to use the tools of analysis with facility, including calculus (in particular integral and curved surface), the elements of complex and Fourier analysis	
is familiar with the methods of solving classical ordinary and partial differential equations, is able to use these methods in routine, practical problems	
knows the structure of the Lebesgue measure and integration; is able to use the concepts of measurement theory in routine theoretical and practical problems	• is able to plan and conduct basic research, experiments or observations of cognitive problems within the scientific fields and disciplines relevant to the undertaken field of study
is able to recognise topological structures occurring in mathematical objects such as in geometry or mathematical analysis; is able to use the basic properties of topological sets, functions and transformations	
uses the language and methods of functional analysis in problems of mathematical analysis and its applications, in particular, uses the properties of classical Banach and Hilbert spaces	
is able to use algebraic methods (with an emphasis on linear algebra) to solve problems in various fields of mathematics and practical tasks	
knows basic probability distributions and their properties, is able to use them to solve practical problems	
is familiar with the basics of statistics (issues in estimation and hypothesis testing) and in the basic statistical methods of treating data	
is able, at an advanced level and including contemporary mathematics, to use and present orally and in writing, the methods of at least one selected field of mathematics: mathematical analysis and functional analysis, the theory of differential equations and dynamical systems, algebra and number theory, geometry and topology, probability and statistics, discrete mathematics and graph theory, logic and set theory	• is able to plan and conduct basic research, experiments or observations of cognitive problems within the scientific fields and disciplines relevant to the undertaken field of study • is able to critically assess the results of experiments, observations and theoretical calculations, as well as discuss measurement errors • is able to present research results in the form of an autonomously prepared discourse (report) containing a description and justification of the work's aim, methodology used, results and their significance in comparison with other similar studies
is able to carry out a proof in a chosen field with the use of tools from other fields of mathematics if needed	• is able to plan and conduct basic research, experiments or observations of cognitive problems within the scientific fields and disciplines relevant to the undertaken field of study • is able to critically assess the results of experiments, observations and theoretical calculations, as well as discuss measurement errors

Table G – continued

Model learning outcomes of the study programme	References to the learning outcomes of the exact sciences broad area of study
is able to identify one's own interests and develop them; in particular, is able to maintain contact with specialists in one's field, for example, to understand their lectures for young mathematicians	• is able to present in an accessible manner the results of discoveries made in the scientific fields and disciplines relevant to the undertaken field of study, as well as in disciplines bordering the related ones • is able at an in-depth level to prepare a variety of written papers in Polish and a foreign language recognised as essential for the scientific fields and disciplines relevant to the undertaken field of study, as well as in disciplines bordering the related ones • is able at an in-depth level to prepare oral presentations in Polish and a foreign language on a topic related to the scientific fields and disciplines relevant to the undertaken field of study, as well as in disciplines bordering the related ones
is able to construct mathematical models that are used in specific applications of advanced mathematics	• is able to critically assess the results of experiments, observations and theoretical calculations, as well as discuss measurement errors • is able to apply attained knowledge in the scientific fields and disciplines relevant to the undertaken field of study to related scientific fields and disciplines • is able to present in an accessible manner the results of discoveries made in the scientific fields and disciplines relevant to the undertaken field of study, as well as in disciplines bordering the related ones
recognises mathematical structures (e.g., algebraic, geometric) in physical theories	
is able to use stochastic processes as a tool for modelling phenomena and analysing their evolution	
understands the mathematical basis of the analysis of algorithms and computational processes	
is able to construct algorithms with good numerical properties, used to solve routine and non-routine mathematical problems	
knows how to use computer-aided methods of proving theorems and logical support for verification and specification	
SOCIAL COMPETENCES	
A graduate:	**A person:**
knows the limitations of one's own knowledge and understands the need for continuing education	• understands the need for lifelong learning, is able to inspire and organise the learning process for others • is able to define the direction of further education and implement the process of self-education
is able to precisely formulate questions that deepen one's understanding of a given topic or find the missing elements of reasoning	
is able to work in a team; understands the need to systematically work on projects that are long-term in nature	• is able to act and work in a group and assume different group roles • understands the need to systematically become familiar with scientific, popular scientific and basic periodicals for the undertaken field of study to broaden and deepen knowledge • is aware of the responsibility for undertaken initiatives in research, experiments or observations; understands the social aspects of the practical application of attained knowledge and skills and the responsibility related to this
understands and appreciates the importance of intellectual honesty in one's own activities and those of others; acts ethically	• is able to appropriately define priorities to perform tasks determined by oneself or others • properly identifies and resolves dilemmas related to practicing one's profession

Table G – continued

Model learning outcomes of the study programme	References to the learning outcomes of the exact sciences broad area of study
understands the need to present selected mathematical achievements in an accessible manner to the general public	• understands the need to systematically become familiar with scientific, popular scientific and basic periodicals for the undertaken field of study to broaden and deepen knowledge • is aware of the responsibility for undertaken initiatives in research, experiments or observations; understands the social aspects of the practical application of attained knowledge and skills and the responsibility related to this • is able at an in-depth level to prepare a variety of written papers in Polish and a foreign language recognised as essential for the scientific fields and disciplines relevant to the undertaken field of study, as well as in disciplines bordering the related ones
is able to autonomously find information in the literature, including in foreign languages	• understands the need for lifelong learning, is able to inspire and organise the learning process for others
is able to formulate opinions on basic mathematical issues	• is aware of the responsibility for undertaken initiatives in research, experiments or observations; understands the social aspects of the practical application of attained knowledge and skills and the responsibility related to this

Source: Resolution of the Minister of Science and Higher Education of 2 November 2011 on the National Qualifications Framework for Higher Education; Resolution of the Minister of Science and Higher Education of 4 November 2011 on model learning outcomes.

2.4. First and second cycle studies in the study programme of "library and information science"

Table H. Learning outcomes of first cycle studies with a practical profile in the study programme of "library and information science"

Learning outcomes of the study programme	References to the learning outcomes of the humanities broad area of study
KNOWLEDGE	
A graduate:	**A person:**
has structured, basic knowledge about library and information science as a scientific discipline providing the theoretical bases, methods and solutions to undertake practical activities in library science, information science, book publishing and archiving	• has structured, basic knowledge of the scientific fields and disciplines relevant to the undertaken field of study, focused on practical applications in cultural, media, promotional and advertising activities of the chosen field
orders and presents basic sources of scientific information on library and information science, as well as professional information on information science, library science, book publishing and archiving activities	
knows the achievements, basic concepts and findings of library and information science relevant to the planning and implementation of practical activities in the field of information science, library science, book publishing and archiving	• has structured, basic knowledge of the scientific fields and disciplines relevant to the undertaken field of study, focused on practical applications in cultural, media, promotional and advertising activities of the chosen field
describes the relationship between information and library science and other disciplines, enabling an interdisciplinary approach to the practice of the profession	• has structured, basic knowledge of the scientific fields and disciplines relevant to the undertaken field of study, focused on practical applications in cultural, media, promotional and advertising activities of the chosen field • has structured, basic knowledge of selected areas of the scientific fields and disciplines relevant to the undertaken field of study, focused on practical applications in cultural, media, promotional and advertising activities of the chosen field

Table H – continued

Learning outcomes of the study programme	References to the learning outcomes of the humanities broad area of study
properly uses the basic scientific terminology of information and library science, as well as the professional terminology used in information science, library science, book publishing and archiving	• knows the basic terminology of the scientific fields and disciplines relevant to the undertaken field of study, and of the cultural, media, promotional and advertising activities related to the chosen field of study
explains the place and role of information mediation, library science, book publishing and archiving in culture and social communication, particularly with regard to scientific information	• has basic knowledge of the structure and functions of the system of culture and media
has knowledge of selected aspects and areas of functioning of the media, culture and science that is important from the perspective of professional practice	
presents basic level information on the history, aims, organisation, functioning and social environment of institutions and organisations active in public communication and the collection, development, storage and sharing of information	• has a basic understanding of the aims, organisation and functioning of institutions associated with the chosen sphere of cultural, media, promotional and advertising activities • has basic knowledge about the audience of cultural, media, promotional and advertising activities, and basic knowledge of the methods of diagnosing their needs and assessing the quality of services
discusses current trends, dilemmas and expectations related to research and professional activities in information science, library science, book publishing and archiving	• has a basic understanding of the aims, organisation and functioning of institutions associated with the chosen sphere of cultural, media, promotional and advertising activities
identifies the basic legal and economic frameworks of information science, library science, book publishing and archiving	• has basic knowledge of the legal and economic conditions for the functioning of institutions related to the chosen sphere of cultural, media, promotional and advertising activities
has basic knowledge about the currently used methodologies in performing tasks, the norms, procedures, tools, technologies and good practices in the professional practice of information science, library science, book publishing and archiving	• has basic knowledge about the methods of performing tasks, the norms, procedures and good practices used in the institutions related to the chosen sphere of cultural, media, promotional and advertising activities
has basic knowledge about the informational environment of modern persons, their informational, communication and reading behaviours	• has basic knowledge about the audience of cultural, media, promotional and advertising activities, and basic knowledge of the methods of diagnosing their needs and assessing the quality of services
explains one's methods of working to users of information, libraries, archives and reading rooms, including the methods of diagnosing their needs and assessing and forming information and reading competencies	
knows the basic, universal principles of workplace health and safety	• has basic knowledge of workplace health and safety in the institutions related to the chosen sphere of cultural, media, promotional and advertising activities
knows and understands the basic concepts, regulations and principles relating to the protection of intellectual property and copyright law	• knows and understands the basic concepts and principles of the protection of industrial property and copyright law
SKILLS	
A graduate:	**A person:**
efficiently finds, assesses and chooses information relevant to one's own or a user's situation and informational needs, using various types of sources and adequate search strategies	• is able to find, analyse, assess, select and use information utilising a variety of sources and methods

Table H – continued

Learning outcomes of the study programme	References to the learning outcomes of the humanities broad area of study
autonomously attains new knowledge and develops professional skills in activities related to information science, library science, book publishing and archiving based on the proper channels of information	• knows how to autonomously attain knowledge and develop the professional skills related to the chosen sphere of cultural, media, promotional and advertising activities
designs and implements routine systems, products, information services and library projects autonomously or in a group	• autonomously plans and implements routine projects related to the chosen sphere of cultural, media, promotional and advertising activities • has the basic organisational skills to plan and implement tasks in the chosen sphere of cultural, media, promotional and advertising activities
autonomously performs routine tasks in collecting, developing and sharing collections and information in various types of modern libraries, including digital and virtual libraries	• autonomously plans and implements routine projects related to the chosen sphere of cultural, media, promotional and advertising activities
autonomously and effectively uses modern information-communication technologies typical for information science, library science, book publishing and archiving activities, as well as for the educational process	• autonomously plans and implements routine projects related to the chosen sphere of cultural, media, promotional and advertising activities • is able to communicate in Polish and a foreign language with specialists from the scientific fields and disciplines relevant to the undertaken field of study by using various communications channels and techniques
recognises the actual information needs of information users, library and archival services customers, as well as book publishing market offers, using basic diagnostic methods	• has the basic skills of conducting social research required to diagnose the needs of the audience for cultural, media, promotional and advertising activities
effectively communicates with information users, library and archival services customers and the book publishing market	
assesses information, library and archiving products, systems and services (also from the area of book publishing), using the typical criteria and methods of measuring quality	• has the basic skills of assessing the quality of services related to cultural, media, promotional and advertising activities
takes into account basic legal regulations in designing activities to be implemented in institutions and organisations functioning in the area of information science, library science, book publishing and archiving	• is able to apply basic provisions of the law relating to the institutions of one's chosen sphere of cultural, media, promotional and advertising activities, in particular copyright law and the management of intellectual property
calculates the cost of planned, chosen professional activities in information science, library science, book publishing and archiving and prepares a typical funding proposal for their implementation	• is able to prepare a funding proposal for a professional project related to the chosen sphere of cultural, media, promotional and advertising activities
compares and analyses various solutions to selected professional problems in information science, library science, book publishing and archiving activities to effectively assess their utility for implementing specific tasks and resolving professional problems	• is able to assess the utility of various methods, procedures, good practices to implement assignments and solve problems related to the chosen sphere of cultural, media, promotional and advertising activities, as well as select and apply the appropriate approach
justifies presented theses and opinions, referring to the achievements of information and library science, as well as the disciplines and professions related to information science, library science, book publishing and archiving	• is able to use substantive arguments and the views of other authors, as well as formulate conclusions

Table H – continued

Learning outcomes of the study programme	References to the learning outcomes of the humanities broad area of study
distinguishes scientific and professional statements and public commentaries in information and library science as well as in professions related to information science, library science, book publishing and archiving	• is able to communicate in Polish and a foreign language with specialists from the scientific fields and disciplines relevant to the undertaken field of study by using various communications channels and techniques
is able to communicate using various communication channels and techniques with specialists in information science, library science, book publishing and archiving	
autonomously develops a written professional project in information science, library science, book publishing and archiving, referring to the most important theoretical approaches, adequate sources of information and professional achievements	• is able to prepare routine written texts in Polish and a foreign language recognised as essential for the scientific fields and disciplines relevant to the undertaken field of study, on specific issues, using basic theoretical approaches and various sources
autonomously prepares bibliographies, analyses and documented texts (informational) in Polish and a foreign language	
prepares and presents a properly documented, short presentation on a selected professional topic from the broadly understood areas of information science, library science, book publishing and archiving, based on scientific and professional achievements	• is able to prepare oral presentations in Polish and a foreign language on specific issues from the scientific fields and disciplines relevant to the undertaken field of study, using basic theoretical approaches and various sources
communicates in a modern foreign language at a level meeting the requirements of the B2 level of the Common European Framework of Reference for Languages	• has language skills in the scientific fields and disciplines relevant to the undertaken field of study that meet the requirements of the B2 level of the Common European Framework of Reference for Languages
SOCIAL COMPETENCES	
A graduate:	**A person:**
is aware of the need to continuously develop one's knowledge and skills in response to the changing conditions of professional practice in information science, library science, book publishing and archiving, and also in culture and science	• understands the need for lifelong learning • participates in cultural life, taking advantage of different media and their various forms
is able to implement assigned tasks in information science, library science, book publishing and archiving while working in a team in various roles	• is able to act and work in a group and assume different group roles
consciously plans professional activities, indicating key factors in their success and assumes responsibility for their proper implementation, consequences and for the professional image one presents	• is able to appropriately define priorities to perform tasks determined by oneself or others • is aware of the responsibility to preserve the cultural heritage of the region, the nation and Europe
attempts to resolve problems faced in professional practice, referring to the achievements and methods of information and library science and best practices in information science, library science, book publishing and archiving	• properly identifies and resolves dilemmas related to practicing one's own profession
is aware of the broadly understood activities in information science, library science, book publishing and archiving for building civil society, equal opportunities, counteracting exclusion and preserving the cultural heritage of the region, the nation and Europe	• properly identifies and resolves dilemmas related to practicing one's profession • is aware of the responsibility to preserve the cultural heritage of the region, the nation and Europe
participates in various forms of cultural events through various media related above all to the broadly understood sphere of the culture of writing	• participates in cultural life, taking advantage of different media and their various forms

Source: Faculty of Management and Social Communication, Jagiellonian University

Table I. Learning outcomes of second cycle studies in the study programme of "library and information science"

Learning outcomes of the study programme	References to the learning outcomes of the humanities broad area of study
KNOWLEDGE	
A graduate:	**A person:**
has structured, in-depth and thorough knowledge of current directions, problems, basic and applied research in information and library science as a scientific discipline providing the theoretical bases, methods and solutions for the practice of library science, information science, book publishing and archiving	• has structured, in-depth and broadened knowledge of the scientific fields and disciplines relevant to the undertaken field of study, focused on practical applications of the chosen sphere in cultural, media, promotional and advertising activities
is able to thoroughly characterise Polish and foreign sources of scientific information on information and library science, as well as related disciplines and professional areas related to the chosen areas of professional and research interests in library science, information science, book publishing and archiving	• has structured, in-depth and broadened knowledge of the scientific fields and disciplines relevant to the undertaken field of study, focused on practical applications of the chosen sphere in cultural, media, promotional and advertising activities • has structured, in-depth and broadened knowledge of selected areas of the scientific fields and disciplines relevant to the undertaken field of study, focused on practical applications of the chosen sphere in cultural, media, promotional and advertising activities
selects proper methods and techniques to solve specific research problems in the chosen areas of information and library science, as well as in the practice of library science, information science, book publishing and archiving, and explains the conditions and principles of their use	• has structured, in-depth and broadened knowledge of selected areas of the scientific fields and disciplines relevant to the undertaken field of study, focused on practical applications of the chosen sphere in cultural, media, promotional and advertising activities • has in-depth knowledge of the audience of culture, media, promotional and advertising activities and in-depth knowledge of the methods to diagnose their needs and assess the quality of services
has structured, in-depth and detailed knowledge of selected areas of applying information and library science	• has structured, in-depth and broadened knowledge of selected areas of the scientific fields and disciplines relevant to the undertaken field of study, focused on practical applications of the chosen sphere in cultural, media, promotional and advertising activities
knows and properly uses the extended scientific terminology of information and library science, as well as the professional terminology used in selected areas of information science, library science, book publishing and archiving	• has extensive knowledge of the terminology of the scientific fields and disciplines relevant to the undertaken field of study, as well as related to the chosen sphere of cultural, media, promotional and advertising activities
precisely and thoroughly explains the role of various information resources in the modern systems of culture and media, as well as the role of institutions and organisations that collect, develop, store and share information in the development and operation of such functions	• has broadened knowledge about the structure and functions of culture and media systems, focused on developing systemic solutions in the chosen sphere of cultural, media, promotional and advertising activities • has detailed knowledge of the aims, organisation and functioning of institutions associated with the chosen sphere of cultural, media, promotional and advertising activities
presents the principles and various ways institutions and organizations that function in information science, library science, book publishing and archiving are organised, managed and conduct public relations; indicates common practices and discusses the procedures for managing projects in these areas	• has detailed knowledge of the aims, organisation and functioning of institutions associated with the chosen sphere of cultural, media, promotional and advertising activities
identifies potential employers, jobs, business opportunities and professional career paths in the information science, library science, book publishing and archiving sectors	

Table I – continued

Learning outcomes of the study programme	References to the learning outcomes of the humanities broad area of study
describes the economic premises for the decisions of consumers' and providers' behaviours in the information market	• has in-depth and broadened legal and economic knowledge of the conditions for the functioning of institutions related to the chosen sphere of cultural, media, promotional and advertising activities
discusses the legal acts governing information science, library science, book publishing and archiving activities and presents the consequences of the laws for these activities	• has in-depth and broadened legal and economic knowledge of the conditions for the functioning of institutions related to the chosen sphere of cultural, media, promotional and advertising activities required to manage such institutions • knows and understands the basic concepts and principles of the protection of industrial property and copyright law and the need to manage the resources of intellectual property
has in-depth knowledge about the currently used methods and tools in the practice of selected areas of information science, library science, book publishing and archiving, focused on innovative solutions of complex problems in non-routine professional situations	• has in-depth knowledge about the methods of performing tasks, the norms, procedures and good practices used in the institutions related to the chosen sphere of cultural, media, promotional and advertising activities, focused on innovatively solving complex problems in non-routine professional situations
presents examples of good practices in the implementation of various tasks in selected areas of information science, library science, book publishing and archiving	
has in-depth knowledge about how information society functions and the needs and behaviours of the customers of services and products in selected areas of information science, library science, book publishing and archiving	• has in-depth knowledge of the audience of culture, media, promotional and advertising activities and in-depth knowledge of the methods to diagnose their needs and assess the quality of services
knows the basic principles of workplace health and safety	• has basic knowledge of workplace health and safety in institutions associated with the chosen sphere of cultural, media, promotional and advertising activities
properly justifies the need to manage the resources of intellectual property in information science, library science, book publishing and archiving	• knows and understands the basic concepts and principles of the protection of industrial property and copyright law and the need to manage the resources of intellectual property
SKILLS	
A graduate:	**A person:**
develops an ordered and selective list of information sources on a defined topic using adequate information resources and search tools and on this basis formulates a critical assessment of the state of research, professional knowledge and skills in selected areas of information and library science, as well as in the practice of information science, library science, book publishing and archiving	• is able to find, analyse, assess, select and integrate information utilising a variety of sources and based on these, formulate a critical judgment
autonomously attains new knowledge and develops professional skills in selected areas of information science, library science, book publishing and archiving; makes autonomous decisions on the direction and character of a planned, professional career	• knows how to autonomously attain knowledge and broaden professional skills to develop abilities and direct one's professional career
plans and implements, autonomously or in a group, an original professional or research project, including an innovative one, in a selected area of information science, library science, book publishing and archiving	• autonomously plans and implements original and innovative projects related to the chosen sphere of cultural, media, promotional and advertising activities • has in-depth organisational skills enabling the planning and innovative solving of complex problems related to the chosen sphere of cultural, media, promotional and advertising activities

Table I – continued

Learning outcomes of the study programme	References to the learning outcomes of the humanities broad area of study
competently uses modern information and communication technologies to conduct professional tasks and implement one's own projects in a chosen area of information science, library science, book publishing and archiving	• autonomously plans and implements original and innovative projects related to the chosen sphere of cultural, media, promotional and advertising activities • is able to communicate in Polish and a foreign language with specialists from the scientific fields and disciplines relevant to the undertaken field of study, as well as with non-specialists, by using various communications channels and techniques
is able to plan and direct the implementation of original projects in information science, library science, book publishing and archiving	• has in-depth organisational skills enabling the planning and innovative solving of complex problems related to the chosen sphere of cultural, media, promotional and advertising activities • is able to prepare a funding proposal for a professional project related to the chosen sphere of cultural, media, promotional and advertising activities and to direct the implementation of the project
designs and conducts research to identify the customers of information, library and archiving products and services and those offered in the book publishing market, as well as to define their needs and preferences	• has in-depth skills of conducting social research required to diagnose the needs of the audience for cultural, media, promotional and advertising activities
interprets the concept of quality in the context of specific professional situations and purposefully and consciously selects the criteria and methods to assess the quality of information, library, archiving and book publishing products and services	• has in-depth skills of assessing the quality of services of cultural, media, promotional and advertising activities
takes into account current legal regulations in projects to be implemented by institutions and organisations operating in the areas of information science, library science, book publishing and archiving; understands the legal framework for the functioning of such institutions	• is able to apply the law on institutions related to the chosen sphere of cultural, media, promotional and advertising activities, especially pertaining to copyright law and the management of intellectual property
finds sources of potential funding for projects in information science, library science, book publishing and archiving	• is able to prepare a funding proposal for a professional project related to the chosen sphere of cultural, media, promotional and advertising activities and to direct the implementation of the project • has in-depth organisational skills enabling the planning and innovative solving of complex problems related to the chosen sphere of cultural, media, promotional and advertising activities
develops a professional project budget in a selected area of information science, library science, book publishing and archiving and prepares an actual funding proposal for the project	• is able to prepare a funding proposal for a professional project related to the chosen sphere of cultural, media, promotional and advertising activities and to direct the implementation of the project
based on the achievements in information and library science, related disciplines and practices, proposes innovative procedures, methodologies and solutions to complex professional problems that respond to the changing conditions of work in the areas of information science, library science, book publishing and archiving	• is able to design innovative methods and procedures of performing tasks and solving problems related to the chosen sphere of cultural, media, promotional and advertising activities and to direct the implementation of the project • has in-depth organisational skills enabling the planning and innovative solving of complex problems related to the chosen sphere of cultural, media, promotional and advertising activities
scientifically justifies presented theses and opinions, and documents the presented information, referring to the achievements of information and library science, related disciplines, practices and the results of one's own research	• is able to use substantive arguments using one's own views as well as those of other authors, formulate conclusions and prepare synthesised summaries

Table I – continued

Learning outcomes of the study programme	References to the learning outcomes of the humanities broad area of study
interprets collected information, draws conclusions and formulates synthesised summaries and abstracts of scientific and professional texts	• is able to use substantive arguments using one's own views, as well as those of other authors, formulate conclusions and prepare synthesised summaries • has in-depth skills of preparing various written texts in Polish and a foreign language recognised as essential for the scientific fields and disciplines relevant to the undertaken field of study
chooses the proper communication channels and techniques for one's own needs to transmit and receive scientific information in information and library science, or professional information in library science, book publishing and archiving	• is able to communicate in Polish and a foreign language by using various communication channels and techniques with specialists from the chosen sphere of cultural, media, promotional and advertising activities, as well as with non-specialists
prepares various forms of written statements (including a master's thesis) in Polish on scientific issues in information and library science or professional issues in information science, library science, book publishing and archiving	• is able at an in-depth level to prepare various written texts in Polish and a foreign language recognised as essential for the scientific fields and disciplines relevant to the undertaken field of study
prepares and presents a longer oral talk in Polish for a public audience using modern presentational forms and technologies, on a topic related to issues in information and library science or on informational, library, book publishing and archiving activities	• is able at an in-depth level to prepare oral presentations in Polish and a foreign language on a topic related to the scientific fields and disciplines relevant to the undertaken field of study or in areas bordering various scientific disciplines
uses a modern foreign language on issues related to information and library science and informational, library, book publishing and archiving activities at a level meeting the requirements of the B2 level of the Common European Framework of Reference for Languages	• has language skills in the scientific fields and disciplines relevant to the undertaken field of study that meet the requirements of level B2+ of the Common European Framework of Reference for Languages
SOCIAL COMPETENCES	
A graduate:	**A person:**
is convinced of the need to permanently develop one's own knowledge and skills, as well as those of one's subordinates and colleagues in response to the changing conditions of professional practice related to information science, library science, book publishing and archiving activities, as well as the growing achievements of information and library science	• understands the need for lifelong learning, is able to inspire and organise the learning process for others
uses one's own statements in various forms to inspire and direct the development of knowledge and skills of the listeners	
is able to implement assigned tasks and undertake new challenges in information science, library science, book publishing and archiving, work in a team in various roles, make an essential contribution and recognise the work of other colleagues in the team	• is able to act and work in a group and assume different group roles
accepts responsibility for proper and timely implementation, the consequences of the planning and implementation of one's own project or that of a team one is directing, as well as for the image portrayed of the professional and scientific community one represents	• is able to act and work in a group and assume different group roles • actively participates in activities on behalf of preserving the cultural heritage of the region, the nation and Europe
defines priorities for undertaken professional or research activities in a manner ensuring competence and effectiveness	• is able to appropriately define the priorities for achieving the tasks performed by oneself or others

Table I – continued

Learning outcomes of the study programme	References to the learning outcomes of the humanities broad area of study
perceives the ethical problems related to one's professional and research work and strives to resolve them while maintaining respect for the values and principles developed in information and library science and the professional practice of information science, library science, book publishing and archiving	• properly identifies and resolves dilemmas related to practicing one's profession
is ready to preserve cultural resources for future generations in selected areas of information science, library science, book publishing and archiving	• actively participates in activities on behalf of preserving the cultural heritage of the region, the nation and Europe
systematically observes current cultural life, including the arts, locally, nationally and globally, and strives to participate, also actively, in selected cultural events and projects	• systematically participates in cultural life, takes an interest in current cultural events, new forms of artistic expression, new phenomena in the arts

Source: Faculty of Management and Social Communication, Jagiellonian University

2.5. Defining learning outcomes for non-degree post-graduate studies

Based on the example of "Protecting information in networks and telecommunications systems: designing and auditing security measures", offered by the Warsaw University of Technology's Faculty of Electronics and Information Technology.

Although the Act – Law on Higher Education and the resolutions issued on its basis do not require post-graduate studies to be assigned to a broad area(s) of study or to have their learning outcomes referenced to the learning outcomes of first or second cycle qualifications as defined in the Minister's resolution on the NQF,[60] the Senate of the Warsaw University of Technology (WUT) adopted a document (regulations) specifying the new principles of conducting post-graduate studies,[61] which follows and is even more rigorous than the regulations of the amended Act – Law on Higher Education,

Post-graduate studies at WUT must be assigned to one or more specific broad areas of study, and the expected learning outcomes (defined for the categories of knowledge, skills and social competence) should be referenced to the learning outcomes for the designated broad area. Learning outcomes for the specific educational modules comprising the post-graduate studies should be referenced to the general learning outcomes of the broad area of study. Learning outcomes for post-graduate studies are approved by the Faculty Council, and then, as part of the application process to offer a study programme, they must be accepted by the Rector.

The way learning outcomes for non-degree post-graduate studies offered at WUT are defined is illustrated by the example of the "Protecting information in networks and telecommunications systems: designing and auditing security measures" study programme provided by the Faculty of Electronics and Information Technology.

The learning outcomes for this programme are presented in Table J. The general learning outcomes listed in the middle column for the categories of knowledge, skills and social competence (K1–K7, S1–S6, SC1–SC4) were referenced to selected descriptors for second cycle studies in the engineering and technology broad area of study and general academic profile (in the first column, the learning outcomes highlighted in black are those to which the learning outcomes of post-graduate studies are referenced; the remaining ones are less visible).

More detailed descriptions of the learning outcomes achieved by graduates of the study programme are formulated for its five, distinguished, individual educational modules and are presented in the last column of Table J. The abbreviations provided in parenthesis refer to the general learning outcomes listed in the middle column.

[60] Resolution of the Minister of Science and Higher Education of 2 November 2011 on the National Qualifications Frameworks for Higher Education.

[61] Resolution of the Warsaw University of Technology Senate of 23 November 2011 on approving the Regulations for Post-graduate studies of the Warsaw University of Technology.

Table J. Non-degree post-graduate qualifications related to the completion of non-degree post-graduate studies in the field of "Protecting information in networks and telecommunications systems: designing and auditing security measures"

Second stage generic descriptors for the broad area of study of engineering and technology with a general academic profile	General learning outcomes for a post-graduate study programme corresponding to selected second stage generic descriptors for the area of engineering and technology and a general academic profile	Learning outcomes for specific educational modules comprising the post-graduate study programme referenced to general learning outcomes for the programme
A person:	**A graduate:**	**A graduate:**
KNOWLEDGE	**KNOWLEDGE**	
• has extensive and in-depth knowledge of mathematics, physics, chemistry and other areas relevant to the undertaken field of study useful for formulating and solving complex tasks in the undertaken field of study • has detailed knowledge of the fields of study related to the undertaken field of study • has structured, theoretically-supported general knowledge of key issues in the undertaken field of study • has theoretically supported detailed knowledge of selected issues related to the undertaken field of study • has knowledge of the developmental trends and the most important new achievements in the scientific fields and disciplines relevant to the undertaken field of study and related disciplines • has a basic understanding of the life cycle of equipment, facilities, and technical systems • knows the basic methods, techniques, tools and materials used in solving complex engineering tasks in the undertaken field of study • has the knowledge necessary to understand the social, economic, legal and other non-technical considerations of engineering activities and their role in engineering practice • has a basic knowledge of management, including quality management and operating a business • knows and understands the basic concepts and principles of protecting industrial property and copyright law and the need for intellectual property management; is able to benefit from the resources of patent information • knows the general principles of initiating and developing forms of individual entrepreneurship, using knowledge from the scientific fields and disciplines relevant to the undertaken field of study	(K1) knows the basics of mathematical cryptology and information security (K2) has a basic knowledge of ICT networks required for the techniques of their protection (K3) knows the basic techniques used in cryptography and information security (K4) knows the threats that may exist in a network and how the infrastructure and network services may be attacked (K5) knows the software used to protect information and ICT networks (K6) knows the basic laws and standards related to information security (K7) knows the basics of information security management	**CRYPTOGRAPHY, CRYPTOGRAPHIC PROTOCOLS** • knows the mathematical foundations of cryptography and is able to perform the necessary calculations for algorithms and protocols (K1) • knows basic cryptographic algorithms and protocols, and how to choose the right kit for one's own uses (K1) • knows how to read technical documentation, design, configure, and use basic cryptographic protocols (S1, SC1) • knows how to use library protocols for e-mail security and data sharing in local networks and the Internet (S1, S4) • knows the basics of using cryptographic smart card security systems, is able to design a protocol using this (K2, K3) • knows how to prepare basic documentation on cryptographic security systems (S3) **NETWORK SECURITY** • knows the basic types of network attacks and steganographic methods and can describe their impact on the social, economic and legal operation of computer networks (K2, K4) • knows how to design security systems appropriate to the identified security threats based on firewalls, VPN, AAA, and IDS/IPS (K4, S2, S6, SC3) • knows how to configure network devices and is able to identify vulnerabilities and ways to better protect these devices (K4, K2, S6) • knows basic security services and is able to identify the tools and protocols for their implementation in telecommunication networks (K1, K5, S4, S6)

Table J – continued

A person:	A graduate:	A graduate:
SKILLS	**SKILLS**	• knows how to solve an assigned problem on network security and implement a simple programme to monitor network events or the security of resources (K5, S2, S5, SC4) • knows how to use technical documentation to obtain the information necessary to operate the Cisco IOS, and is able prepare the documentation for an autonomously written programme (S1, S3) • is able to identify security threats based on collected traffic data transmitted over networks based on the TCP/IP stack (K4, S5)
(1) General skills (unrelated to the engineering field of study)	**(1) General skills (unrelated to the engineering field of study)**	**NETWORK AUDIT, SECURE SOFTWARE**
• is able to secure information from the literature, data bases and other properly selected sources, also in English or another foreign language recognised as the language of international communication for the undertaken field of study; is able to integrate, interpret and critically assess the information collected, as well as draw conclusions, formulate and comprehensively justify one's opinions • is able to communicate using a variety of techniques in the professional community and in other communities, also in English or another foreign language recognised as the language of international communication in the undertaken field of study • is able to prepare a scientific paper in Polish and a short scientific report in a foreign language considered to be essential in the scientific fields and disciplines relevant to the undertaken field of study, on one's research findings • is able to prepare and present an oral presentation on specific issues in the undertaken field of study in both Polish and a foreign language • is able to define the direction of further education and implement a process of autonomous learning • has language skills in the scientific fields and disciplines relevant to the undertaken field of study that meet the requirements of the B2+ level of the Common European Framework of Reference for Languages	(S1) knows how to read technical documentation and the legal acts associated with the presented topic (S3) knows how to prepare the technical documentation of a designed solution	• knows the basic security threats and methods of their neutralisation (K2, K3, K4) • knows how to exploit vulnerabilities found during security testing (S5) • knows how to read technical documentation, configure and use virtual tools for security testing (S1, S5) • knows and is able to use measures to protect the network and server infrastructure and software (K5, S6) • knows the basic security issues related to web-based applications, and knows how to identify and correct errors in these applications (B4, S2) • knows how to prepare basic documentation on security testing (S3) • knows how to develop tools for security testing (S5, SC3)
(2) Basic engineering skills	**(2) Basic engineering skills**	**SECURITY MANAGMENT**
• is able to use information and communication technologies relevant to the tasks typical of engineering activity • is able to plan and carry out experiments, including measurements and computer simulations, to interpret results and draw conclusions • is able to use analytical, simulation and experimental methods to formulate and solve engineering tasks and simple research problems	(S2) is able to design a technical solution for computer network security (S5) is able to use programming for security analysis and the protection of information and network services	• knows the basic security models (Bell-LaPadula, Biba, Clark-Wilson, Chinese walls), access models (DAC, MAC) and representation rights (access matrix, capabilities, ACLs, RBAC) (K1, K3) • knows the basic criteria for evaluating security systems (Common Criteria, TCSEC, TNI, ITSEC, SEI-CMMI, SW-SMM) (K6, K7) • knows the basics of safety management based on risk analysis (K6, K7) • knows how to use the methods of managing risk: detection, deterrence, prevention, correction, reproduction, compensation (S2, SC2)

Table J – continued

A person:	A graduate:	A graduate:
• in formulating and solving engineering tasks, is able to integrate knowledge from the scientific fields and disciplines relevant to the undertaken field of study and apply a systems approach, also taking into account non-technical aspects • is able to formulate and test hypotheses related to engineering problems and simple research problems • is able to assess the utility and possibilities of using new achievements (techniques and technology) in the undertaken field of study • has the necessary preparation to work in industry and knows the rules of safety associated with such work • is able to make a preliminary economic analysis of the undertaken engineering activities		• knows how to read and use documents and standards of security management, particularly the ISO 27000 series of standards (K7, S1) • knows how to prepare the basic documentation for a sample ISMS organisation (K6, K7, S3) • is able to design, verify, operate and use the access model of an example of an information system (S2, S3, S4, SC3) **LEGAL ASPECTS OF SECURITY** • knows the basic legal regulations on the protection of information (K6, SC2) • knows the principles of legal and professional responsibility in the event of security breaches (K6, K7, SC2) • knows the requirements of preparing security documentation (K6, K7, S1, S3) • knows how to find a legal document on a situation related to a security incident (S1, K6, K7) • knows how to prepare basic documentation on security incidents (K7, S3)
(3) Skills directly related to practicing engineering • is able to critically analyse and assess the functioning of existing technology, in particular equipment, facilities, systems, processes, and services, especially in conjunction with the undertaken field of study • is able to identify and formulate the specification of complex engineering tasks characteristic for the undertaken field of study, including non-routine tasks, taking into account their non-technical aspects • is able to assess the suitability of methods and tools to solve engineering tasks characteristic of the undertaken field of study and perceive their limitations; using conceptually new methods, is able to solve complex engineering tasks specific to the undertaken field of study, including non-routine tasks and those with a research component • is able to design a complex device, object, system or process related to the undertaken field of study according to preset specifications, taking into account non-technical aspects, as well as to implement the project – at least in part – by using proper methods, techniques and tools, including adapting existing tools to this purpose or developing new ones	**(3) Skills directly related to practicing engineering** (S4) knows how to assess the utility of technical solutions for network security (S6) knows how to configure basic network security services used in practice	

Table J – continued

A person:	A graduate:	A graduate:
SOCIAL COMPETENCES	**SOCIAL COMPETENCES**	
• understands the need for lifelong learning; is able to inspire and organise the learning process for others • understands and is aware of the importance of the non-technical aspects and effects of engineering, including its impact on the environment, and thus, the ensuing responsibility for the decisions that are made • is able to act and work in a group and assume different group roles • is able to appropriately define priorities to perform tasks determined by oneself or others • properly identifies and resolves dilemmas related to practicing one's profession • is able to think and act creatively and entrepreneurially • is aware of the social role of a technical university graduate, and especially understands the need to formulate information and opinions on technical achievements and other aspects of engineering practice, and to transmit this to society, especially through mass media; strives to transmit such information and opinions in a generally understandable way, substantiating various points of view	(SC1) understands the need for lifelong learning; is able to inspire and organise the learning process for others (SC2) understands and is aware of the importance of the non-technical aspects and effects of engineering, including its impact on the environment, and thus, the ensuing responsibility for the decisions that are made (SC3) is able to act and work in a group and assume different group roles (SC4) is able to appropriately define priorities to perform tasks determined by oneself or others	

Annex 3. Implementing the National Qualification Framework for Higher Education in doctoral studies offered by the Faculty of Electronics and Information Technology, Warsaw University of Technology

3.1. Solutions at the level of higher education institutions

Doctoral studies at Polish universities are provided by authorised faculties. Warsaw University of Technology (WUT) is authorised to provide doctoral studies in 18 of 19 faculties.[62]

The document (regulations) approved by the University's Senate as a result of the passage of the Act – Law on Higher Education establishing the new requirements for conducting doctoral studies includes a statement directly relating to qualifications frameworks in their European dimension:[63]

> *A person who has completed his/her doctoral studies at the Warsaw University of Technology and is awarded a doctoral degree has gained the competences corresponding to the third cycle of the European Qualifications Framework for the European Higher Education Area and level eight of the European Qualifications Framework*

although, of course, the description of those competences (learning outcomes achieved after completion of doctoral studies) is developed in line with PQF level 8 descriptors.

The WUT Senate regulations delegate responsibility for defining learning outcomes for doctoral studies and their corresponding programme of study to the faculty level, as well as providing:

- recommendations on how to describe learning outcomes for knowledge, skills and social competences,
- the required volume of courses leading to the achievement of the described competences expressed in ECTS credits (being a simple adaptation of the provisions set forth in the resolution).

3.2. Solutions at the level of the faculty

To implement the WUT Senate regulations for doctoral studies, the Faculty of Electronics and Information Technology's Faculty Council passed a resolution on the principles of conducting doctoral studies in the Faculty.[64]

The requirements adopted by the Faculty Council specify, among other things:

- learning outcomes,
- the doctoral study programme leading to the achievement of the learning outcomes.

Learning outcomes

The learning outcomes approved by the Faculty Council are a slightly modified version of the learning outcomes recommended by the Senate of the Warsaw University of Technology.

[62] According to legal regulations, authorisation is granted to faculties which employ the relevant number of staff having the academic degree of doctor or habilitated doctor.

[63] Resolution of the Senate of Warsaw University of Technology of 22 February 2012 on Regulations governing doctoral studies at the Warsaw University of Technology.

[64] Resolution of the Faculty Council of the Faculty of Electronics and Information Technology of 22 May 2012 on the principles of conducting doctoral studies in the Faculty.

Learning outcomes for doctoral studies at the WUT
Faculty of Electronics and Information Technology

As a result of doctoral studies, a doctoral candidate will have achieved the following learning outcomes:

1. In the area of knowledge:

a) an advanced understanding of the foundation of the discipline or disciplines related to the area of research,
b) well-developed, detailed theoretical knowledge of a specific research area, based primarily on sources from scientific publications, that includes the latest scientific achievements in the research area,
c) knowledge of research methodology, as well as the legal and ethical aspects of conducting scientific research,
d) knowledge of the methods of preparing papers and research results,
e) basic knowledge of securing and conducting research projects, including the financial and legal considerations of such projects,
f) basic knowledge of technology transfer and the commercialisation of research results, in particular issues related to the protection of intellectual property,
g) knowledge of the methods and modern techniques of teaching.

2. In the area of skills:

a) efficiently collects information related to research activities from various sources, including those in foreign languages, correctly selects and interprets the information,
b) capably uses his/her own knowledge to critically evaluate the results of research and other original work – his/her own and that of others – and its contribution to the development of the represented scientific discipline; in particular, is able to assess the utility and ability to use the results of the theoretical work in practice,
c) is able to recognise and formulate complex tasks and problems associated with the represented scientific discipline, including the conceptualisation of new tasks and research problems, leading to innovative technical solutions,
d) is able to solve complex tasks and problems associated with the scientific discipline represented, including non-routine tasks and problems using conceptually new methods, contributing to the development of knowledge or providing innovative solutions for practical use, whose level of originality justifies publication in peer-reviewed publications,
e) is able to plan and conduct his/her own research project in a methodologically correct manner related to the research activities carried out in a larger team,
f) is able to document the results of research and prepare papers having the character of a scientific publication, also in English, according to the principles of preparing such papers, particularly with respect to copyright laws,
g) is able to communicate effectively using a variety of techniques in the international academic and professional community, and in other environments, also in English; is able to clearly present his/her achievements and ideas, as well as cite relevant arguments in academic discussions and public debates on various subjects; is able to lead a scientific discussion,
h) is prepared to teach classes and perform other forms of educational activities in a methodologically correct manner, using modern teaching techniques at a higher education institution.

3. In the area of social competence:

a) is self-critical in his/her original work; understands and perceives the need to constantly improve professional and personal competences, in particular by following and analysing the latest developments related to the scientific discipline represented,

b) is aware of the importance of acting professionally, respecting the rules of professional ethics and developing the ethos of the scientific and professional community,
c) is able to think and act independently, creatively and entrepreneurially, takes initiative in developing new ideas and searching for innovative solutions; takes initiative in identifying new areas of research,
d) understands and perceives the need to engage in training specialists in the represented discipline of engineering and in other activities leading to the development of a knowledge-based society,
e) is aware of the social role of doctoral graduates, and especially understands the need to provide the public – including through the mass media, with information and opinions on the achievements of science and technology; will endeavour to provide such information and opinions in an appropriate, universally understandable way, justifying different points of view.

The intended learning outcomes should be achieved as the result of:

- an individual programme of study, which includes:
  - research work, conducted under the guidance of an advisor, leading to the preparation of a doctoral dissertation and the awarding of a doctoral degree,
  - courses fundamental to the field of study in which the studies are undertaken, at an appropriately advanced level,
  - courses related to the scientific discipline in which the studies are undertaken, at an appropriately advanced level and presenting the latest scientific achievements,
  - courses unrelated to the field of study and scientific discipline that provide general professional skills, including those related to conducting research,
  - professional practice,
- participation in the life of the academic community – national and international
- meeting the requirements associated with defending a doctoral dissertation.

The study programme

The individual study programme developed by the doctoral student in consultation with his/her advisor must meet the requirements defined by the general framework of study programmes.

Framework of study programmes

courses (educational modules)	number of ECTS
courses developing general skills	20
advanced, core subject courses (general), including those offered by the Centre for Advanced Studies	10 6
advanced courses in the scientific discipline represented	10
total advanced courses including courses in English	25 4
Research seminar (SN1, ..., SN8)	16 (8x2)
Research Laboratory (PN1, ..., PN7)	147 (7x21)
Preparing the doctoral dissertation	28
Professional practice – teaching (PZ1, ..., PZ4)	4
Total	240

Notes

a) A Pedagogical Seminar (5 ECTS) is required in the set of courses (educational modules) developing general skills, while the recommended courses consist of:
   – "Methodological and ethical aspects of research" (3 ECTS),
   – "Techniques of communication in research and teaching" (4 ECTS),
   – "Conducting research projects and the commercialisation of research results" (4 ECTS).
b) The requirement of taking advanced core subject courses (general) means that a doctoral student must pass courses totalling the indicated number of ECTS credits from the set of subjects defined by the Faculty as "Advanced Courses – General" (about 30 subjects), including courses offered at the Faculty or by the Centre for Advanced Studies, a university-wide institution.
c) The requirement of taking advanced courses in the represented scientific discipline means that a doctoral student must pass courses totalling the indicated number of ECTS credits from one of a defined group of subjects offered at the Faculty (each of these groups includes 15 to 30 subjects):
   – "Advanced subjects – Automation",
   – "Advanced subjects – Information Technology",
   – "Advanced subjects – Telecommunications",
   – "Advanced subjects – Electronics".
d) "Research Laboratory" (PN1, ..., PN7) is an educational module representing the scientific research conducted by a doctoral student under the supervision of an advisor in successive semesters (1, ..., 7). This module is attained upon the recommendation of the advisor, based on the progress of the doctoral student in conducting his/her research. To attain "Research Laboratory", the following requirements must also be met:
   – in order to attain PN2 and PN4, a doctoral student must demonstrate appropriate achievements in disseminating his/her research results (presentations at scientific conferences and publications),
   – in order to attain PN5, a doctoral student must begin his/her doctoral dissertation.

The individual study programme may include courses offered at the Faculty, taught at WUT by other units, in particular by the Centre for Advanced Studies or offered by another institution providing doctoral level studies.

Matrix of learning outcomes

A matrix of learning outcomes shows that the study programme developed by the Faculty enables the achievement of all defined learning outcomes. This matrix follows the solution approved for first and second cycle studies.

	KNOWLEDGE							SKILLS								COMPETENCES				
	a	b	c	d	e	f	g	a	b	c	d	e	f	g	h	a	b	c	d	e
advanced level foundation courses (general)	++							+												
advanced level courses in the particular academic discipline		++						+	+	+	+									
Pedagogical seminar				+			++	+							++		+			
Methodological and ethical aspects of research			++			++		+									++			+
Communication techniques in academic work and teaching			+	++			+						+	+	+					+
Conducting research projects and commercialising research results			+		++			+										+		
Research Seminar (SN1, ..., SN8)		+							+					++						
Research Laboratory (PN1, ..., PN7)	+	++	+		+			++	++	++	++	++	++	++		++		++		
Preparing the doctoral dissertation													++							
Professional practice – teaching (PZ1, ..., PZ4)															++				+	
Involvement in the academic community – national and international				+					+					++		++	++	+	+	+
Fulfilling the requirements related to defending the doctoral dissertation														+						

The number of + symbols in a given cell presents the extent to which third cycle learning outcomes are attained by achieving the learning outcomes of the specific educational modules presented in the matrix, or in another way.

\+ attained to a small degree,

++ attained to a significant degree.

Educational Research Institute
www.ibe.edu.pl | www.kwalifikacje.edu.pl
krkbiuro@ibe.edu.pl