# Designing Integral Learning Outcomes in Higher Education Within the Frameworks of the Competency-Based Approach

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*Uptick of informatization and technologization of society, increased competition both in labor markets and in learning services have caused dramatic changes in higher education and have led to its reorientation from knowledge-centric to the competency-based learning paradigm. Developing and implementing flexible learning paradigm consider one of modern universities' key priority within the European Higher Education Area. Since the main purpose of modern humanities is to form a conscious and responsible attitude of human being towards own learning and carrier in terms of dynamic changes, the issue of designing integral learning outcomes in higher education, technologization of competency acquisition and its further development in lifelong education becomes especially relevant. The study is aimed at a critical analysis of the modern experience in organizing the learning process on the competency-based approach, disclosing, exemplified by research competence, the end-to-end design technology of integral learning outcomes in the context of the triple system of learning professionals with academic degree.*

*Keywords: society, technologization, organizing the learning process, integral learning, educational innovation*

## INTRODUCTION

The theoretical background of transition to the competency-based learning paradigm and introducing the competency-based approach has been elaborated by R. Barnett (1994), G. Klemp (1980), D. McClelland (1973), J. Raven (1984), Y. Tatur (2004), R. Wite (1959), who substantiated the demand to overcome

knowledge-centrism in education, classified competencies, identified their specific features and methods of detection. Modern research on the issue raised focuses on disclosing the competency-based learning essence (Mulder et al., 2008; Gervais, 2016; Navarre Cleary, 2021), classifying competencies (Rawboon et al., 2021), finding effective ways and means of implementing the competency-based approach (Simonds et al., 2017; Hrytsenko, 2020), particularities of the integral learning outcome assessment. In particular, M. Navarre Cleary (2021) notes that the CBE program (Calgary Board of Education) is marked by its developing essence, since "transformed learners understanding of what they knew about themselves and what they imagined they could do in the world by enabling individualized instruction and coaching from faculty and advisors, by providing a framework for validating students' experiential learning, and by making degree completion possible" (Navarre Cleary, 2021). While educational programs in higher education are being periodically revised, it is considered expedient to update the program results (competencies) by forecasting future needs (personal, market). That is why it is fair to suggest that "universities across the globe should reform their educational strategies and consider the competencies that will be required in the future by industries associated with this part of the world" (Rawboon et al., 2021; Nagymzhanova et al., 2018).

M. Bezanilla (2019), N. Boyer and K. Bucklew (2019), C. Marinho-Araujo and L. Almeida (2017) and others, have covered various aspects of designing as well as implementing the competency-based approach. However, most results of development suffer from the lack of technologization, which prevents their practical implementation (Haydanka, 2020). It has been proved by Raven's (1984) classification (Raven, 1984), containing the excessive set of unstructured personal qualities (37 positions) and, as a result, does not allow to diagnose integral outcomes at final stage of training.

There are still significant controversies regarding competency itself; modern researchers (Boritz and Carnaghan, 2010; Wagenaar, 2014) have pointed them out. Competency is understood as a set of certain skills, such as 1) reading, writing, and calculating skills, communication skills (McClelland, 1973); 2) human basic characteristics leading to effective results at the workplace (Klemp, 1980); 3) the ability (Rychen and Salganic, 2003; Holubnycha et al., 2019; Poliakova et al., 2019); 4) mastering large and complex skills; 5) a coordinated cluster of knowledge, skills and abilities (Mulder, 2014); 6) diversified set of individual and sociocultural resources, the integrity of cognitive, emotional and social dimensions (Marinho-Araujo and Almeida, 2017); 7) a set of knowledge, skills, abilities, experience and behavior leading to implementing single acts effectively (Maaleki, 2018); 8) active combinations of knowledge, abilities, and intentions which enable people to successfully and responsibly respond to changing conditions (Weng et al., 2020); awareness (Padua and Gonzalez Smith, 2020). The European Commission Recommendations on Key Competencies for Lifelong Learning define key competencies as a combination of knowledge, skills and attitudes (European Commission, 2019). According to the outcomes of the best practices of organizing competency-based learning in American universities, S. Kellogg (2018) concluded that competency is considered as knowledge, skills and abilities or, in fact, what a student can do (Kellogg, 2018). Similar views are shared by N. Duță and E. Rafaila (2014), who claim that competency has three dimensions: 1) cognitive dimension – knowledge; 2) functional dimension – skills; 3) attitudes-values dimension, which is related to the individual autonomy.

We share the position of those researchers, who criticize the existing attempts to simplify the competency-based approach, to reduce competencies to specific knowledge. As the authors of the article "The new competence concept in higher education: error or enrichment?" rightly remarks that such attempts are deprived of scientific background, since knowledge is a part of competence, as competence comprises the collection of knowledge, skills and attitudes (Mulder et al., 2008).

The authors of the report "Key competences in Europe: Opening doors for lifelong learners across the school curriculum and teacher education" also note that concepts "competence" and "skill" are not identical: "The definition of competence ... goes beyond cognitive aspects, including attitudes and abilities in addition to the skillset" (Gordon et al., 2009). Researchers pay special attention to the technological aspects of forming as well as assessing competencies. It is not a coincidence that their recommendations state the following: "The technologies of assessing …competences should become a key element of the

professional development of teachers and these technologies should be applied also in initial teacher education…" (Gordon et al., 2009).

We consider the competency-based approach developers' offer grounded to take into account, when implementing it in higher education, therefore, all formations of the future competent professionals such as ideological, value, intellectual, and behavioral are justified. Proceeding from this, Y. Tatur (2004) interprets competence as "an integral quality of individual, characterizing the desire and ability (readiness) to implement one's potential (knowledge, skills, experience, personal qualities, etc.) for successful activities in a certain area" and distinguishes between equivalent cognitive, ethical and social components (Tatur, 2004).

Having analyzed thoroughly the issue raised, authors concluded that transition in higher education to the competency-based learning paradigm has primarily declarative nature and explained by the following disadvantages and miscalculations:

- the simplified conception of the competency-based approach, leveling of competencies concerning outcomes at specific learning stages (knowledge, skills, abilities, etc.) or their combinations;
- the lack of scientifically grounded classifications of competences in modern triple system of higher education;
- competence inconsistency offered in compliance with the principles of development, continuity, predictability, regularity in educational and vocational training;
- uncertainty of both specifics and terms to acquire (deepen, improve) various competencies;
- the lack of modern diagnostics for measuring integral learning outcomes (competencies) of future professionals with academic degree;
- ignoring a technological aspect in competency forming in the lifelong learning system.

**THEORETICAL OVERVIEW**

The issue of classification of competencies, developing criteria for assessing integral learning outcomes in higher education remains debatable. There are mechanical attempts to unify general (key) competencies, as evidenced by adopting a policy paper "The Key Competences for Lifelong Learning", which identifies the following eight key competencies for lifelong learning (European Commission, 2019). The developed list erroneously combines competences, competencies, as well as with certain personal qualities (literacy and culture), which creates serious obstacles to their coordinated forming and further deepening.

The lack of scientifically grounded classification of integral learning outcomes in higher education has caused terminological discordance. In some publications, along with established conceptual categories of "key competencies", "professional competence", "communicative competence", "foreign language communicative competence" (Bogush et al., 2019; Kachmarchyk et al., 2019; Mammadov et al., 2019) etc., arguable terms are adopted, which significantly complicate modern scientific discourse: "cross-curricular competencies" (Gewerc et al., 2011), "technical competency" (Bovermann et al., 2018; Sinchev et al., 2018), "intercultural competence" (Tomozeiu et al., 2016; Holubnycha et al., 2019; Casañ-Pitarch et al., 2020), "traditional teaching competencies", "original teacher competency", "traditional competencies", "individual competencies", "core competencies", "specific competencies", "most critical competencies" (Weng et al., 2020); "cultural competence", "intercultural communicative competence" (Padua and Gonzalez Smith, 2020).

Some researchers unjustifiably expand the system of integral learning outcomes, consider a competency framework as a mechanical connection of other competencies, which is often pointless. Evidence of this trend is the article "The Competency-Based Approach to Passing First Certificate in English", where authors used the dubious definition of linguistic competency as a combination of the so-called five practical linguistic competencies – listening, reading, writing, speaking, and use of English, but didn't argue the need to distinguish between communicative, linguistic and language competencies (Kostikova et al., 2019). At the same time, a substitution of concepts was revealed in this article, since listening, reading, writing and speaking are language activities, not integral learning outcomes of English.

We see the causes of low learning technologization on the competency-based approach in the absence of clear understanding how a competency is formed at a certain academic degree, in the replacement of integral learning outcomes (competencies) with interim ones (knowledge, skills, abilities, etc.), in the cloning of competencies and an unjustified increase in their number. In this regard, we share the opinion that "before modeling a professional according to the requirements of the competency-based approach, that is, determining competence number and content, it is necessary to determine very carefully the professional's scope of authority and functions performed to show one's competence" (Tatur, 2004).

The superficial conception of the competency-based approach has led to a number of disadvantages in the context of its development and implementation in modern university practice. It is primarily about replacing integral learning outcomes (competencies) with a list of competences, increasing competencies number by duplicating them, composing, identifying with learning principles and forms. This is evidenced by use of concepts "Higher Education Leadership Competencies" (instead of "leadership competency"), "Organizational competency" and "structural competency" (instead of "managerial competency"), "emotional competency" and others (Pokrova, 2021). In particular, some researchers suggest that "emotional competence can be taught and effectively learned by students, constituting a commitment to teach not only theoretical knowledge but also skills – in this case, of an emotional nature – that student can use to achieve their personal, academic, and professional goals" (Gilar-Corbi et al., 2018). However, in our opinion, the quoted statement contradicts the integral essence of competency, violates pedagogical logic; namely, it presents content, not the learning outcomes. In addition, competency acquisition cannot be limited only to gaining knowledge and forming skills, since it includes, in addition to the cognitive and activity components, ideological position, values, experience and other personal qualities (Sadykov et al., 2014).

Most recently, many scientific forums have discussed this issue. For example, the Berlin conference "Modeling and Measuring Competencies in Higher Education" (2013) raised a number of issues related to identifying, designing, forming and diagnosing the students' integral learning outcomes. Particular attention was drawn to a report "An approach to testing & modeling competence", where the author suggested applying the technological approach to the competence assessment according to the following criteria: "1. Tap into complex physical and/or intellectual skills and… 2. Produce an observable performance using a common… 3. Standardized set of tasks with… 4. High fidelity to the performances observed in "real-world" "criterion" situations from which inferences of competence can be drawn, with scores reflecting… 5. The level of performance (mastery or continuous) on tasks in which… 6. Improvement can be made through deliberate practice" (Shavelson, 2013). However, in our opinion, this list does not allow to drive the evaluation procedure algorithm, which should be based on the logic of competence forming as the integral learning outcome in higher education.

Only a few studies highlight some aspects of technologizing the competency-based approach, e.g., competency development at the academic degree, assessment of the acquired integral learning outcomes according to specific criteria, etc. However, the overwhelming majority of development results has deprived of algorithm system. For example, N. Boyer and K. Bucklew (2019) offered a modular principle for competency forming. According to the principle each competency is assigned to a separate module or course: "Competency-based education must start with these three fundamental design criteria as they serve as the building blocks of the higher education enterprise system, specifically the SIS: course/program catalog, class/schedule building, and term/subterm/time frame" (Boyer and Bucklew, 2019). It's worth noting the fact, that technologization in education presupposes a clear algorithm for constructing interrelated activities of learning subjects, aimed at achieving goals and consistently gaining integral outcomes (competencies). Each stakeholder must understand the logic of acquiring competence in order to gradually, stage by stage, track this process, successfully complete their own tasks, establish effective cooperation with other participants, respond flexibly to problems, thoughtfully and consistently develop a distinct learning path in the main directions and forms (theoretical training, practical training, research work; formal training, informal training).

Technologization of the competency-based learning in higher education requires taking into account the academic degree, the type of competence, and the educational program specifics, moreover, modern

researchers emphasize the importance of this factor. The authors of this article rightly remark that "A Model for the Evaluation of Competency-Based Learning Implementation in Higher Education Institutions: Criteria and Indicators", "the competences within the degree are to be detailed further at a later stage, using tools such as competence maps or curriculum grids to define how they will be acquired in different units. Assessment also needs to be consistent with the methodological choices made, to determine the degree of acquisition of those competences, both upon completion of each unit or each degree. This will establish the extent to which the outcomes in the graduate profile have been achieved" (Bezanilla et al., 2019).

In recent years, researchers have been highlighting the practical experience of implementing the competency-based approach based on various learning technologies, such as design (Simonds et al., 2017), multimedia (Hrytsenko, 2020), etc.

In general, we share the position of A. Hrytsenko (2020), who prefers to choose the competency-based higher education and notes its fundamental advantages over the content-focused traditional higher education setting. The researcher rightly remarks the integral nature of professional competence of the future history teacher. However, from our perspective, the absolute priority given to multimedia technologies in this process is considered as doubtful, since they perform an auxiliary instrumental function of illustrating the academic discipline content, but do not provide full-scale gaining integral learning outcomes – professional competence by future educators (Imanbayev et al., 2020).

Practical experience in implementing the competency-based approach based on design technology, determining competencies in particular specialties for various academic degrees are covered in the article "Competency-Based Education in a Traditional Higher Education Setting: A Case Study of an Introduction to Psychology Course". Researchers have proven the chosen approach importance for all learning subjects, e.g., "For instructors, beginning with learning goals is a best practice that is the center of CBE and stays in the forefront of course design, instruction, evaluation of student work, and assessment of the course. Students gained more ownership over their learning and found that learning can transfer to other settings and can be highly relevant in the form of projects based on realistic application with clearly-outlined end results" (Simonds et al., 2017; Sembin et al., 2021). At the same time, the authors of the publication have not managed to overcome knowledge-centrism in solving the issue raised, to avoid competence identification with a set of knowledge, abilities and skills, separate tasks or functions. This is evidenced by the following author's interpretations of the future psychologists' learning outcomes, which are, namely, reproductive tasks, not competencies, e.g., "Read and summarize general ideas and conclusions from psychological sources accurately", "Identify and navigate psychology databases and other legitimate sources of psychology information" (Simonds et al., 2017). Emphasizing the importance of projects for developing competencies, researchers concluded that "the student and instructor experiences in this course were that projects successfully engaged students as a platform for gaining skills, knowledge, and abilities" (Simonds et al., 2017). The cited statement confirms the declarative nature of the competency-based approach, which has actually been replaced by the knowledge-centric approach in the above-mentioned research.

## MATERIALS AND METHODS

To achieve the stated aim, a system of the following research methods was used:
- theoretical: analysis of scientific publications to determine the current status of the issue raised in pedagogical theory; comparison of various definitions of the key concept "competence"; generalization of modern teaching practices in higher education on the competency-based approach; modeling the structure and content of research competence by academic degrees;
- empirical: monitoring of the competency-based learning to determine the stakeholders' technologization to achieve the purposeful integral outcomes; questioning lecturers and students, graduate students in order to identify their attitude towards the competency-based approach, professional readiness for designing integral learning outcomes in the context of the tricycle learning system in higher education;
- google Forms cloud service for conducting an interactive survey, processing empirical data.

In the process of empirical research, perception and attitude towards the competency-based approach in university circles, the current status of its practical implementation, the readiness for the competency progressive formation on a technological basis, and the diagnosis of integral learning outcomes have been determined. For this aim, we conducted a survey among lectures and applicants for higher education (both students and post-graduate students).

In order to ensure the objectivity of answers received, sufficient representativeness of the sample interviewed by the main features (university centers and periphery, classical universities, industry-specific universities, various categories of respondents), to overcome the communication barriers caused by quarantine restrictions due to the COVID-19 pandemic, we chose an interactive questionnaire form based on the Google Forms cloud service using an anonymous profile. Participation in the questionnaire was free and didn't require registration of the participants' personal data.

Having analyzed the answers received; we are ready to remark a generally positive attitude of students towards the competency-based approach in higher education (74.5%). Most respondents see the main purpose of introducing this learning innovation in creating conditions for the integration of learning, self-education and professional training of students (51.1%), ensuring both integrity and consistency in professionals' training aimed at achieving integral outcomes (38.3%).

The survey has shown a number of problems posing serious obstacles to the competency-based learning. A significant proportion of respondents in their answers indicated a need for additional information and clarifications regarding organizing learning on the competency-based approach (59.6%) and recognized some difficulties along this path (19.1%).

The conception of competence as personal readiness to act productively in the specific discipline is quite representative, effectively and responsibly perform assigned tasks, solve problems, and implement their own functions (63.8%), which indicates a tendency to distinguish between interim and integral learning outcomes, to overcome knowledge-centrism in assessing the quality of higher education.

However, the practical implementation of the competency-based approach remains a serious problem. Only 17% of respondents clearly conceive the algorithm of acquiring competencies, while majority of respondents require advice and assistance (63.8%). Almost 20% of the interactive survey participants answered negatively, which confirms the lack of appropriate technological basis for achieving integral learning outcomes in higher education.

The questionnaire has confirmed the lack of information, personnel, diagnostic support of the competency-based learning. In particular, 34.1% of respondents noted that they had no opportunity to receive a piece of advice on the competency-based approach or were significantly limited in this direction; 53.2% gave preference to self-education while solving issues related to practical implementation of the competency-based approach in their own activities (Oliinyk, 2020). Besides, the diagnostics choice for measuring qualities by respondents is quite indicative: 44.6% chose means of controlling interim outcomes (knowledge or skills), while 14.9% indicated the lack of appropriate technologies, methods and tools. Thus, the facts obtained during the empirical study have showed an insufficient level of the competency-based learning technologization in modern higher education, the lack of the well-developed algorithm to form competencies in the triple system of training professionals with higher education.

## RESULT AND DISCUSSION

This research was based on the assumption that successful gaining of integral learning outcomes in the context of the triple learning system in higher education will be ensured due to the end-to-end design technology of competencies, providing for specifying stages, content, procedures and tools to elaborate the appropriate algorithm for their purposeful acquisition.

Clarifying the competency-based approach as a paradigmatic educational innovation, we rely on the following leading ideas:
- focus on achieving the scientifically ground system of competencies, ensuring the professionals' readiness for self-education, fulfilling professional duties, and career growth;

- progressive renewal and enrichment of competencies, taking into account the particular field well-grounded development for the foreseeable future;
- the competency-based system conditioning by higher educational grounding, their purposeful deepening, expansion and enrichment throughout life and professional activity;
- mobility, flexibility, prospects in acquiring integral personal qualities;
- technologization, the end-to-end acquisition of competencies in the context of the triple learning system in higher education;
- diagnostics of competencies in the terms of lifelong education. The transition to the competency-based learning paradigm in higher education begins with modelling a competent professional with an academic degree, defining a system of professional competencies in accordance with current requirements and development potential in a particular field.

Competent professionals with academic degree should have a unique modern scientific mindset, democratic ideals, spiritual values, and multi-functionality (Saifnazarov, 2019). Hence, we interpret competence as an integral personal quality, reflecting its readiness to fulfill own functions (civil, educational, service, industrial, scientific, etc.) successfully, to carry out self-learning, to ensure ongoing professional development and career growth to achieve both personally, and socially significant results.

We consider the structural components of competence to be interim, aspect indicators of knowledge obtained by assigning scientific information (knowledge), practical application of acquired knowledge (skills), working out automatically acquired practices (abilities), etc., while competency is the final integral outcome certifying personal readiness for independent social, professional, self-educational activities, as well as self-development and self-actualization.

Throughout life and professional career, a person constantly updates, deepens, improves the system of competencies, in which have been identified three groups, such as 1) general (key, basic), 2) professional and 3) occupational (Nagymzhanova et al., 2019; Vitchenko and Vitchenko, 2019).

We consider general competencies as integral learning outcomes that are formed, developed, deepened throughout life; they socialize an individual and technologize successful professional development. We divide general competences into the following three subgroups:
- *Personal competencies:* worldview, moral and value, functional and behavioral, culturological;
- *Social competencies:* public, leading;
- *Instrumental competencies*: communicative, cognitive, self-learning, research.

Professional competencies are, in our opinion, the integral outcomes of professional training in the specialty. For example, Master in Educational, Pedagogical Sciences must have the following professional competencies: managerial, diagnostical and predictive, designing and correctional, technological, ethical and pedagogical, professional and creative, etc.

Occupational competencies reflect integral outcomes of the professional training in a particular area of specialization. For example, Master in Pedagogy of Higher Military School must obtain a number of occupational competencies, e.g., translation, logistics, information and propaganda, training, mobilization, etc.

The main factor in acquiring competencies is the technologization of learning, ensured by the invariant logic of achieving the target integral outcomes: 1) knowledge; 2) skills; 3) abilities; 4) experience; 5) ways of thinking; 6) mindset and values (Tokatligil et al., 2021). The content of each competence depends on the level of higher education, objectives, educational program specializations, which, in turn, predetermines its end-to-end technological design for lifelong education. Let us illustrate this with the example of research competency; its development has been carried out in the process of experimental learning according to the author's program (Table 1).

**TABLE 1**
**AUTHORS' PROGRAM ON DEVELOPING RESEARCH COMPETENCE IN HIGHER EDUCATION**

| Academic degrees | Taught course | Number of credits | Planned integrated outcomes |
|---|---|---|---|
| 1st – Bachelor's Degree | Basics of Scientific Research | 3 ECTS credits | Research competence of a secondary school teacher |
| 2nd – Master's Degree | Research Approach in Higher Education | 4 ECTS credits | Research competence of a university lecturer assistant |
| 3rd – PhD's Degree | Theory and Methods of Special (Pedagogical, Linguistic, etc.) Research in Higher Education | 5 ECTS credits | Research competence of a higher education lecturer researcher |

The future professional's research competence is the instrumental integral learning figure, realized in willingness to investigate various phenomena and processes of the external world independently; identify, classify and solve already existing problems scientifically; enrich career with new research methods and tools. Depending on the academic degree, the specifics of educational programs and their specializations (educational and professional, educational and scientific), the semantic and functional content of research competency is gradually changing. The implementation of the research competence's end-to-end design technology involves a gradual renewal and deepening of its content components, due to the complication of the future professionals' research functions.

*The bachelor's research competence* is formed of the research elements previously mastered at the general secondary education level (knowledge of particular research methods, the ability to conduct empirical research independently, record its progress and achievements, analyze and generalize the results obtained, make conclusions, experience the defense of research project in public) with the aim of further deepening and expanding. Acquiring the bachelor's research competence is due to the specifics of future learning and career, which is characterized by the conditions' complexity and uncertainty; therefore, it is subject to the sequence mastering of the following elements:
- the research basic knowledge on a particular theme, scholarly apparatus, basic research methods, key scientific and ethical principles; criteria and norms for evaluating bachelor's works;
- the ability to design the research main stages; to follow the logic in implementing the research goals (tasks); to determine the scholarly apparatus under the guidance; to select the research main methods; to systematize and generalize the research outcomes; to formulate interim and general conclusions;
- skills in planning, organizing and conducting independent scientific research on the theme raised to solve some scientific challenges;
- the experience of exploratory activities, realised independently under field studies in primary positions to solve some complex specialized tasks and practical issues both in learning and career; independent participating in scientific events of the disciplinary local level (messages, reports, analytical reviews, presenting practical studies in seminars, sections, exhibitions and works' defence);
- active and purposeful exploratory activity, persistence in achieving research objectives; analytical skills, critical thinking, researcher's inquiry reflexivity;
- scientific worldview, argumentativeness, respect for scientific heritage, traditions and values of modern science.

*The master's research competence* is formed at the qualitatively different stage of personal and professional development, whose career provides for research and introducing innovations. That is why this integral personal outcome is achieved through the consistent mastering of the following components:

- knowledge of basic methods, ethical norms and rules of scientific research aimed at solving scientific problems;
- the ability to plan and organize own research, select appropriate research methods, generalize the results obtained, formalize and present scientific achievements in accordance with current requirements, in compliance with the principles of academic integrity;
- the skills of planning, organizing and conducting original innovative research on an independently initiated theme to solve an urgent scientific problem;
- the experience of exploratory activities independently in the process of educational, professional, research practices in primary positions, providing the ability to integrate knowledge and solve complex problems in broad or multidisciplinary contexts; independent participating in scientific events of the interdisciplinary regional level (critical reviews, speeches at seminars, conferences and works' defence);
- initiative in defining urgent scientific problems, the originality of approaches to solve them; well-reasoned criticism, reflexivity;
- innovative scientific thinking; innovativeness (Saifnazarov et al., 2020).

*Research competence* acquires a new quality at the PhD's degree of higher education, providing for the professional-researcher training according to the following invariant logic:

- knowledge of theory and fundamental research methods; methods of organizing scientific research aimed at forming new approaches to solve urgent and significant scientific issues (a set of theoretical and applied problems); the system of research methods; qualification requirements for preparing, examining and defending dissertations (theses), personal responsibility for their violations; norms and rules of scientific ethics;
- the ability to identify existing contradictions in the world around and independently determine approaches to overcome them; initiate innovative research projects and participate in implementing the research tasks; select and adjust the system of research methods, formalize and represent own scientific achievements in accordance with current requirements, in compliance with the principle of academic honesty;
- the skills of planning, organizing, carrying out, adjusting an essential scientific research on an independently initiated theme to solve an urgent scientific problem;
- experience of assistant practice in scientific institutions, institutions of higher education in primary positions, providing for the ability for research and innovation; independent participating in scientific events at the national level (speeches, co-reports at seminars, conferences and works defense); dialogical communication on the scientific problems with domestic and foreign scientists;
- generating new scientific ideas and approaches, creative search activity, responsibility, tolerance, leadership and autonomy, debating; purposefulness, consistency and integrity in solving the scientific issue raised;
- creative thinking; value attitude to alternative well-reasoned scientific views, ways and means for solving research problems.

The author's end-to-end design technology involves the use of appropriate technological support (procedures, tools), making the development of research competence algorithmic (Table 2).

**TABLE 2**
**TECHNOLOGICAL SUPPORT FOR THE DEVELOPMENT OF RESEARCH COMPETENCE IN THE CONTEXT OF THE TRIPLE LEARNING SYSTEM IN HIGHER EDUCATION**

| Academic degree | Procedures | Tools |
|---|---|---|
| 1st – Bachelor's Degree | Review of experimental developments, scientific report, peer review, public defence of bachelor's work | Qualification analysis, assessment of the results of bachelor's work |
| 2nd – Master's Degree | Presentation of innovative proof-of-concepts, scientific report, peer review, public defence of master's work | Qualification analysis, assessment of the results of master's work |
| 3rd – PhD's Degree | Trialability of theoretical and applied findings, scientific report, examination, professional seminar, public defence of a Ph.D. dissertation | Expert analysis, comparison, assessment of the results of dissertation research, scientific discussion |

The efficiency of the research competence development in the triple higher education, showed in the authors' experimental work in the course of training future lecturers in the specialty "Educational, Pedagogical Sciences" (Vitchenko and Vitchenko, 2012; 2019), depends on compliance with a number of conditions:

- motivation of students' research activities based on taking into account particular interests and abilities, development potential, and a conscious desire for constructive competitiveness;
- bond between scientific research, theoretical education and practical training;
- interdisciplinarity of researcher's inquiry, consistency and continuity in the use of appropriate methods, forms and means of its organization;
- research development and problems, their compliance with the specifics of students' future learning, self-learning and professional activities;
- the frequency of diagnosing the search results, the objectivity of measuring the research competence components using formalized tools (M. Rokich's methods "Value orientations", "Q-sorting" by V. Stefanson, B. Bass's method for diagnosing personality orientation and N. Khitrova's method "Business situations" and others);

The significance of the offered technology lies in the fact that it provides a scientifically ground logic of designing integral learning outcomes in higher education, allows to algorithmize the process of acquiring competencies in the unity and sequence of mastering their structural components by academic degrees, educational program specializations. In response to the well-developed algorithm, each stakeholder better understands the difference between current and integral learning outcomes, gets a real opportunity for their practical acquisition in the system of appropriate procedures and actions. Thus, the process basis of design is being laid for overcoming some disadvantages in implementing the competency-based approach (declarativity, matter of form, knowledge-centrism), favourable conditions arise for the holistic implementation of the innovative potential of the competency-oriented higher education.

**CONCLUSIONS**

The competency-based approach is the modern learning innovative paradigm aimed at the conceptual learning renewal in higher education, its reorientation towards achieving integral learning outcomes (competencies), characterized by personal and social significance, as well as personal socialization and professionalization. The success of transition to the competency-based learning paradigm, the introduction of a new model for training competent professionals with academic degree directly depends on the competence technologization in the unity of its cognitive-reflexive, emotional-sensual, moral-ethical, axiological and praxeological components. Designing of competencies should be carried out taking into

account the applicants' previous learning achievements, particular characteristics of the learning degree, the priorities of self-development in the lifelong learning context.

Nowadays, there is an insufficient differentiation of competencies according to educational programs; the fragmentation of diagnosing learning outcomes, there is the lack of modern diagnostics that would allow measuring integral personal innovations, and not separate competence components (knowledge, skills, abilities, etc.). The latter testifies to the prospects for further research on the issue raised, the development of both theoretical and applied foundations to implement the competency-based approach in higher education.

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