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TECHNOLOGIES FOR DEVELOPING UNIVERSITY STUDENTS' CAPACITY TO ADAPT TO INNOVATIVE CHANGES IN HIGHER EDUCATION

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Abstract: This article presents a scientific-theoretical substantiation of the pedagogical technologies through which university students' capacity to adapt to innovative changes in the higher education system can be purposefully developed. The relevance of the study is determined by the accelerating pace of technological, curricular, and organisational innovation in higher education, which increasingly requires students not merely to master a fixed body of knowledge but to respond flexibly and productively to continually changing learning conditions, tools, and formats. The aim of the research is to define the structure of adaptive capacity as a pedagogical category, to substantiate the technologies through which its components can be developed in the educational process of a higher education institution, and to identify the pedagogical conditions and problems associated with their implementation. The study employed the methods of theoretical analysis and systematisation of scientific literature, comparative-pedagogical analysis, structural-functional modelling, and pedagogical observation. The analysis established that adaptive capacity to innovation comprises four interrelated components — cognitive-flexible, motivational-volitional, operational-technological, and reflective-evaluative — and that its purposeful development is best achieved through a coordinated complex of technologies, including problem-based and project-based learning, case-based and simulation technologies, mentoring and peer-learning formats, and reflective practice supported by digital tools. The conclusion substantiates the necessity of the systematic, cross-curricular application of these technologies, of targeted training of academic staff in their use, and of the introduction of diagnostic instruments capable of tracking the development of students' adaptive capacity over the course of study. Practical recommendations are proposed for their gradual introduction into the educational process of higher education institutions.

Keywords: higher education, innovative change, adaptive capacity, pedagogical technology, problem-based learning, project-based learning, reflective practice, digital learning environment, academic mobility.

INTRODUCTION

Contemporary higher education is developing under conditions of continuous and accelerating innovation: curricula are revised more frequently than before, digital learning platforms and artificial-intelligence-based tools are introduced into the educational process, academic mobility and credit-transfer mechanisms alter established modes of study, and labour-market requirements shift more rapidly than academic programmes can be redesigned to meet them. In such conditions, a student's success depends not only on the volume of subject knowledge acquired but, to an increasing degree, on the capacity to adapt productively to new learning technologies, new organisational forms of study, and new professional requirements as they arise.

The strategic documents of the Republic of Uzbekistan aimed at the modernisation of higher education — in particular, the Decree of the President No. PF-60 of 11 May 2022 and the Concept for the Development of the Higher Education System until 2030 — assign priority to the introduction of innovative educational technologies and to the corresponding renewal of graduates' competences, including the ability to work effectively under conditions of continuous change [1; 2]. This normative foundation increases the relevance of a scientific elaboration of the pedagogical technologies through which students' adaptive capacity to innovation can be deliberately and systematically developed, rather than left to form spontaneously as a by-product of exposure to change.

Despite a considerable body of research on innovative pedagogical technologies as such, the question of which technologies specifically develop students' capacity to adapt to innovation — as distinct from merely delivering innovative content through traditional means — remains insufficiently elaborated in the pedagogical literature. The aim of the present article is therefore to define the structural components of adaptive capacity to innovation as a pedagogical category, to substantiate the technologies through which each component can be purposefully developed, and to identify the problems that arise in implementing these technologies together with scientifically grounded solutions.

LITERATURE REVIEW AND METHODS

The theoretical foundation of the study draws on several complementary lines of research. A. Bandura's theory of self-efficacy provides grounds for treating a student's belief in his or her own capacity to master new tasks and technologies as a central psychological prerequisite for productive adaptation to innovation, since students with low self-efficacy tend to perceive innovative change as a threat rather than an opportunity.

D. Kolb's theory of experiential learning, describing the cycle of concrete experience, reflective observation, abstract conceptualisation, and active experimentation, offers a methodological basis for understanding how adaptive capacity is built through repeated, reflectively processed encounters with new and unfamiliar learning situations rather than through the passive reception of information about them.

E.M. Rogers's theory of the diffusion of innovations was used to characterise the typical stages through which an individual moves in adopting an innovation — from initial awareness, through persuasion and decision, to implementation and confirmation — and to identify the points at which targeted pedagogical support is most needed to prevent students from disengaging from an innovative learning format.

J.P. Kotter's model of organisational change management, though originally developed for organisational contexts, was applied by analogy to the individual level in order to substantiate the sequence of pedagogical actions — creating a sense of the need for change, building the requisite skills, and consolidating new habits of learning — that a coordinated set of educational technologies should reproduce at the level of the individual student.

The following research methods were employed: theoretical analysis and systematisation of scientific literature; structural-functional modelling, used to substantiate the component composition of adaptive capacity; comparative-pedagogical analysis of technologies currently used to support innovative learning formats in higher education; and pedagogical observation, used to identify typical difficulties encountered by students and academic staff in the course of innovative change.

RESULTS AND DISCUSSION

1. The pedagogical essence of adaptive capacity to innovation. Adaptive capacity to innovation is understood in this study as an integrated personal quality that enables a student to perceive innovative changes in the educational process not as a disruption but as a natural condition of study, to master new tools, formats, and requirements within a reasonable period, and to maintain or improve the quality of his or her own learning outcomes while doing so. This capacity is not identical with general academic ability; a highly capable student accustomed to a stable, teacher-directed format may nonetheless adapt poorly to an unfamiliar, technology-mediated, or self-directed learning environment.

2. Structural components of adaptive capacity. The analysis allows adaptive capacity to innovation to be represented as a unity of four interrelated components.

The cognitive-flexible component comprises the ability to restructure existing knowledge and habitual procedures in the light of new information, tools, or requirements, rather than applying familiar methods mechanically to unfamiliar situations.

The motivational-volitional component comprises the willingness to engage with an unfamiliar or initially uncomfortable learning format, sustained by a sufficient level of self-efficacy and by tolerance for the temporary decline in performance that frequently accompanies the early stage of mastering something new.

The operational-technological component comprises the practical skills required to operate within a changed educational environment — for example, the use of a new digital platform, a new assessment format, or a new mode of collaborative work.

The reflective-evaluative component comprises the ability to analyse one's own experience of adapting to an innovation, to draw generalisable conclusions from it, and to apply these conclusions when the next innovation is encountered, in keeping with the logic of Kolb's experiential learning cycle.

3. Technologies for developing adaptive capacity. The analysis of pedagogical practice allows several groups of technologies to be identified as particularly effective for the purposeful development of the components described above.

Problem-based and project-based learning technologies place the student in a position of having to identify an unfamiliar problem, select appropriate methods and resources independently, and produce a substantive result under conditions of genuine uncertainty, thereby exercising the cognitive-flexible and operational-technological components directly.

Case-based and simulation technologies allow students to encounter, in a controlled educational setting, situations analogous to real innovative changes — for instance, the sudden introduction of a new professional standard or technology — and to practise responding to them without the full consequences of a real professional error.

Mentoring and peer-learning formats support the motivational-volitional component by providing students with a model of successful adaptation demonstrated by a more experienced peer or academic staff member, and by reducing the sense of isolation that often accompanies the early, uncertain stage of engaging with an innovation.

Reflective practice supported by digital tools — structured reflective journals, digital portfolios, and post-activity analytics — provides the systematic basis for the reflective-evaluative component, allowing the student's experience of adaptation to be documented, reviewed, and consciously applied to subsequent situations rather than being forgotten once the immediate task is completed.

4. Pedagogical conditions for effective implementation. The effectiveness of the described technologies depends on several conditions: the deliberate, cross-curricular coordination of their use, rather than their episodic application within a single course; the corresponding preparedness of academic staff to design and facilitate problem-based, case-based, and reflective learning activities; a supportive academic climate in which an initial decline in performance during the early stage of adaptation is treated as a normal part of learning rather than as a failure; and the availability of diagnostic instruments capable of tracking the development of adaptive capacity itself, separately from ordinary academic achievement.

5. Problems and solutions. The first problem consists in the predominance of traditional, lecture-based formats that leave little room for the exercise of independent problem-solving; the solution is the systematic, faculty-wide introduction of problem-based and project-based learning components into existing curricula. The second problem

is the insufficient preparedness of academic staff to design and assess project-based and case-based learning activities; the solution is the inclusion of corresponding modules in staff-development and advanced-training programmes. The third problem is the absence of validated instruments for diagnosing students' adaptive capacity to innovation, as distinct from their subject-matter achievement; the solution is the elaboration of a diagnostic toolkit assessing the cognitive-flexible, motivational-volitional, operational-technological, and reflective-evaluative components separately. The fourth problem is the uneven distribution of mentoring support across faculties and courses; the solution is the institutionalisation of structured peer-mentoring programmes as a standard element of the educational process rather than an optional initiative dependent on individual staff enthusiasm.

CONCLUSION

The results of the study show that university students' capacity to adapt to innovative changes in higher education is not a spontaneous by-product of exposure to innovation but a pedagogically manageable quality composed of cognitive-flexible, motivational-volitional, operational-technological, and reflective-evaluative components, each of which can be purposefully developed through an appropriately selected pedagogical technology.

The analysis confirms that problem-based and project-based learning, case-based and simulation technologies, mentoring and peer-learning formats, and digitally supported reflective practice constitute a coherent, mutually reinforcing complex of technologies capable of developing these components in a coordinated manner, provided that they are applied systematically across the curriculum rather than in isolated instances.

The systematic, cross-curricular introduction of these technologies, the targeted preparation of academic staff for their use, and the development of instruments for diagnosing students' adaptive capacity are proposed as the principal directions for translating the described approach into practice. The consistent implementation of these measures would allow higher education institutions to prepare graduates capable of engaging productively with the continuous innovative change that characterises both contemporary education and the modern labour market.

REFERENCES

1. Decree of the President of the Republic of Uzbekistan No. PF-60 "On the Development Strategy of New Uzbekistan for 2022–2026", 11 May 2022. — Tashkent, 2022.

2. Resolution of the President of the Republic of Uzbekistan on the Concept for the Development of the Higher Education System of the Republic of Uzbekistan until 2030. — Tashkent, 2019.

3. Kolb D.A. Experiential Learning: Experience as the Source of Learning and Development. — Englewood Cliffs, NJ: Prentice-Hall, 1984. — 256 p.

5. Rogers E.M. Diffusion of Innovations. — 5th ed. — New York: Free Press, 2003. — 551 p.

6. Azizxo'jayeva N.N. Pedagogical Technologies and Pedagogical Skill. — Tashkent: TDPU Publishing, 2006. — 192 p.

8. Yo'ldoshev J., Usmonov S. Fundamentals of Pedagogical Technology. — Tashkent: O'qituvchi, 2004. — 208 p.