Organization of Choice in the Context of Non-Formal Education

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Recognition of Non-Formal Education Outcomes

МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ
ХАРКІВСЬКИЙ НАЦІОНАЛЬНИЙ ЕКОНОМІЧНИЙ УНІВЕРСИТЕТ
ІМЕНІ СЕМЕНА КУЗНЕЦЯ

УХВАЛЕНО:
рішення вченої ради
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Володимир ПОНОМАРЕНКО

ПОЛОЖЕННЯ ПРО ПОРЯДОК ВИЗНАННЯ РЕЗУЛЬТАТІВ НЕФОРМАЛЬНОЇ ТА ІНФОРМАЛЬНОЇ ОСВІТИ У ХАРКІВСЬКОМУ НАЦІОНАЛЬНОМУ ЕКОНОМІЧНОМУ УНІВЕРСИТЕТІ ІМЕНІ СЕМЕНА КУЗНЕЦЯ
(нова редакція)

Developed in accordance with:

- the Law of Ukraine “On Education” No. 2145-VIII of September 5, 2017;
- the Law of Ukraine “On Higher Education” No. 1556-VII of July 1, 2014;
- the Procedure for the Recognition in Higher and Professional Pre-Higher Education of Learning Outcomes Acquired through Non-Formal and/or Informal Education (registered with the Ministry of Justice of Ukraine on March 16, 2022 under No. 328/37664), approved by the Order of the Ministry of Education and Science of Ukraine No. 130 of February 8, 2022;
- the Regulations on the Organization of the Educational Process at Simon Kuznets Kharkiv National University of Economics (new edition).

Characteristics of Non-Formal Education

Main **Characteristics** of Non-Formal Education

1. Voluntariness is defined by the learner's independent choice whether to participate in the learning process.

2. Flexibility is ensured by the absence of rigid programs and curricula, with topics adapted to the learners' needs.

3. Practical orientation is characterized by a focus on skills that can be applied immediately.

4. Variety of learning formats: trainings, seminars, online courses, workshops, summer schools, clubs, educational games.

5. Absence of official state-recognized documents – learners usually receive a certificate of participation or simply acquire knowledge and experience.

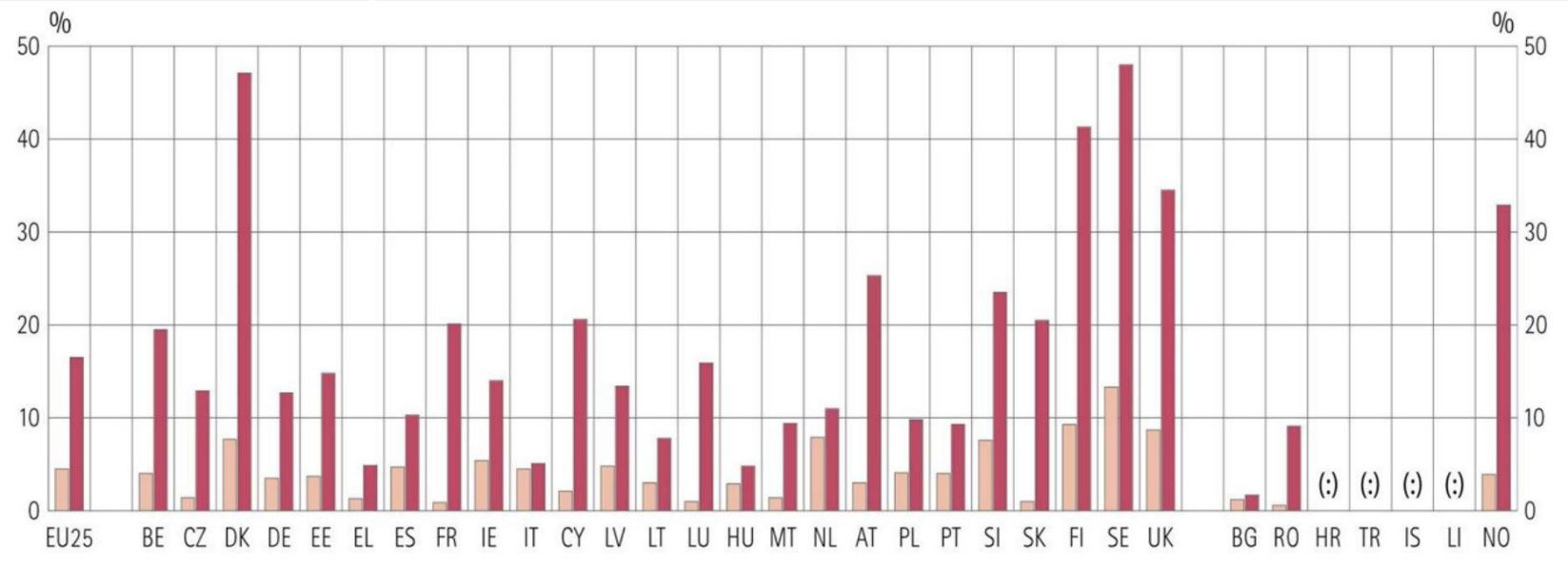
Examples of Non-Formal Education

- Courses in digital literacy (Prometheus, Coursera, EdEra).
- Trainings in leadership, critical thinking, communication.
- Community initiatives (e.g., youth clubs, volunteer programs).
- Language learning through courses or conversation clubs.

Comparison of Formal and Non-Formal Education

Criterion	Formal Education	Non-Formal Education
Institutions	Schools, colleges, universities	Courses, trainings, online platforms, community initiatives
Regulation	Strictly defined by state standards and curricula	Flexible, depends on the organizer and learners' needs
Certification	Diploma, school certificate, state-recognized qualification	Certificate of participation or informal recognition
Content of Learning	Standardized programs, focus on fundamental knowledge	Elective topics, practice-oriented
Teaching Methods	Lectures, seminars, tests, exams	Trainings, workshops, discussions, projects, case studies
Target Audience	Pupils, students, those pursuing official qualifications	Anyone, regardless of age or previous level of education
Purpose	Obtaining an official qualification, professional preparation	Personal development, new skills, professional growth
Duration		

Strengthening the Role of Non-Formal Education



The share of the population participating in formal education

The share of the population participating in non-formal education

Most Rapid Growth in the Number of Participants in Non-Formal Education

According to Eurostat, UNESCO, OECD, and studies by domestic researchers, the following periods of the most rapid growth in the number of participants in non-formal education can be identified:

Worldwide:

•**2015–2019** — the development of online platforms (Coursera, edX, Udemy). Eurostat recorded that the share of the adult population in the EU participating in non-formal education increased from 34% in 2011 to 40–45% in 2019.

•**2020–2021** — during the COVID-19 pandemic, according to UNESCO and OECD, the number of learners on global online platforms more than tripled in 2020.

•**2022–2024** — steady growth of 10–15% per year, with a focus on professional digital skills, AI technologies, cybersecurity, and languages.

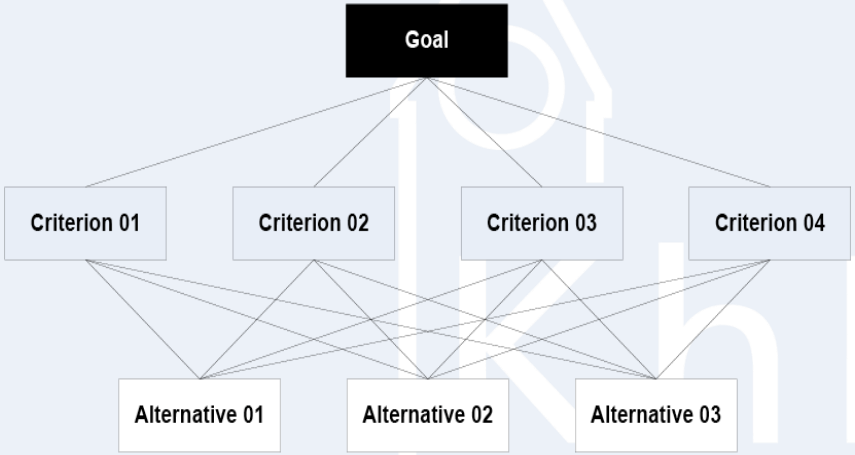
In Ukraine:

•**2018–2019** — the emergence of a large number of free online courses (Prometheus, EdEra, VUM online) and active integration into global platforms.

•**2020–2021** — according to Prometheus estimates, the number of registered users almost doubled during the first year of the pandemic.

•**2022–2024** — non-formal education is actively used for upskilling, reskilling, and distance learning during martial law.

Stages of the Analytic Hierarchy Process



Analytic Hierarchy Process uses the transformation of quality factors into quantitative characteristics and consists of three stages.

1. At the first stage, the structure of the task is investigated, which includes the identification of the most important elements of the hierarchy, which are factors that influence decision-making.
2. At the second stage on this basis the relative importance of each element of the hierarchy is determined by a pair comparison of their subjective assessments.
3. The third stage consists in comparison of quality assessments of all possible alternatives for each element of the hierarchy. AHP allows these estimates to be compared and, using appropriate selection strategies, to formulate the principle of optimal choice for the given task.

The 1st stage. Investigation of the Structure of the Problem

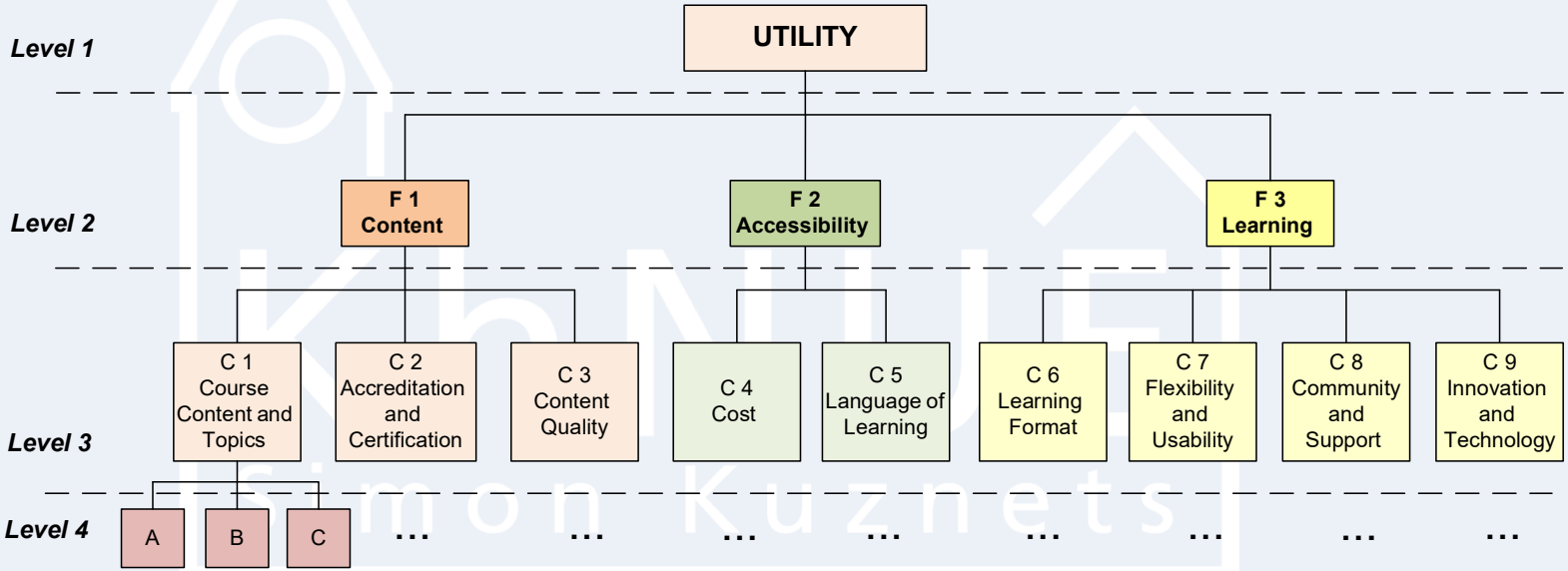
Criterion Code	Title	Essence
Factor 1. Content		
C1	Course Content and Topics	Determines whether the platform is universal or specialized.
C2	Accreditation and Certification	Determines the extent to which course content has official confirmation and recognition.
C3	Content Quality	Assesses the professionalism of instructors, the depth of material, and the topical relevance of courses.
Factor 2. Accessibility		
C4	Cost	Evaluates the financial accessibility of learning.
C5	Language of Learning	Defines the accessibility of course content for comprehension or the opportunity to acquire language skills.
Factor 3. Learning		
C6	Learning Format	Defines the presence and usability of diverse forms of knowledge delivery and assessment: video lectures, interactive tasks, online tests, group projects.
C7	Flexibility and Usability	Assesses the availability of mobile applications, opportunities for offline learning.
C8	Community and Support	Assesses the availability of support from organizers and participants, as well as opportunities for personalized assistance.
C9	Innovation and Technology	Evaluates the extent to which platforms employ artificial intelligence for personalized learning.

The Hierarchy of Selection Criteria

Content (F1) = (Course Content and Topics (C_1), Accreditation and Certification (C_2), Content Quality (C_3));

Accessibility (F2) = (Cost (C_4), Language of Learning (C_5));

Learning (F3) = (Learning Format (C_6), Flexibility and Usability (C_7), Community and Support (C_8), Innovation and Technology (C_9)).



The 2nd stage. Determination of the Relative Importance of Each Element

Assigned value	Definition	Explanation and recommendations for use
1	Equally important	Both objects are equal to each other in terms of predominance
3	Weak importance	There are some reasons to consider the first object to be somewhat better than the other
5	Strong importance	There are grounds to consider one object to be better than the other
7	Demonstrated importance	There are good reasons to consider the first object better than the other
9	Absolute importance	The overwhelming weight of one object compared to another does not raise any doubts
2,4,6,8	Intermediate value	Used in cases where the choice between the two adjacent unpaired numbers causes complications
Numbers inversely proportional to the above	If the object x^i received one of the above grades when comparing with the object x^j, object x^j receives the rank that is inversely proportional to the rank of the object x^i	

The blocks of cells for building solution matrices:

1 Set of selection criteria.

2 Scale of relative importance for paired comparisons.

3 Generalized table of paired comparisons.

4 Table of paired comparisons by the factor **Content**.

5 Table of matched comparisons by the factor **Accessibility**.

6 Table of paired comparisons by the factor **Learning**.

7 Matrix of priority on alternatives to choice of information system.

8 Summary matrix of the priorities (utility functions) according to the types of information system.

Generalized Table of Paired Comparisons

GENERALIZED TABLE OF PAIRED COMPARISONS

	complete matrix			normalized matrix			Average by line
	CONTENT	ACCESSIBILITY	LEARNING	CONTENT	ACCESSIBILITY	LEARNING	
CONTENT	1.000	3.000	5.000	0.652	0.730	0.333	0.572
ACCESSIBILITY	0.333	1.000	9.000	0.217	0.243	0.600	0.354
LEARNING	0.200	0.111	1.000	0.130	0.027	0.067	0.075
SUM	1.533	4.111	15.000				

Vector of local priorities of level 2

initial data

intermediate results

In the example given here the vector of local priorities derived from the average values will look like:

0,572* **CONTENT** + 0,354* **ACCESSIBILITY** + 0,075* **LEARNING**.

Calculation of the Aggregated Comparison Matrices

TABLE OF PAIRED COMPARISONS BY THE FACTOR **CONTENT**

	complete matrix			normalized matrix			Average by line	Weights
	Course Content and Topics	Accreditation and Certification	Content Quality	Course Content and Topics	Accreditation and Certification	Content Quality		
Course Content and Topics	1.000	3.000	5.000	0.652	0.667	0.625	0.648	0.370
Accreditation and Certification	0.333	1.000	2.000	0.217	0.222	0.250	0.230	0.131
Content Quality	0.200	0.500	1.000	0.130	0.111	0.125	0.122	0.070
SUM	1.533	4.500	8.000					

The vector of weights of 3th level elements for group **CONTENT**

TABLE OF MATCHED COMPARISONS BY THE FACTOR **ACCESSIBILITY**

	complete matrix		normalized matrix		Average by line	Weights
	Cost	Language of Learning	Cost	Language of Learning		
Cost	1.000	6.000	0.857	0.857	0.857	0.303
Language of Learning	0.167	1.000	0.143	0.143	0.143	0.051
SUM	1.167	7.000				

The vector of weights of 3th level elements for group **ACCESSIBILITY**

TABLE OF PAIRED COMPARISONS BY THE FACTOR **LEARNING**

	complete matrix				normalized matrix				Average by line	Weights
	Learning Format	Flexibility and Usability	Value	Innovation and Technology	Learning Format	Flexibility and Usability	Value	Innovation and Technology		
Learning Format	1.000	3.000	4.000	5.000	0.561	0.649	0.304	0.333	0.462	0.034
Flexibility and Usability	0.333	1.000	8.000	2.000	0.187	0.216	0.609	0.133	0.286	0.021
Community and Support	0.250	0.125	1.000	7.000	0.140	0.027	0.076	0.467	0.177	0.013
Innovation and Technology	0.200	0.500	0.143	1.000	0.112	0.108	0.011	0.067	0.074	0.006
SUM	1.783	4.625	13.143	15.000						

The vector of weights of 3th level elements for group **LEARNING**

Priority Vectors

The priority vector will look like:

0,370* **Course Content and Topics** +
+0,131* **Accreditation and Certification** +
+0,070* **Accreditation and Certification**.

The value of the Course Content and Topics gross factor will be calculated as:

a=0,572*0,648=0,370.

UTILITY = a* Course Content and Topics +
+ b * Accreditation and Certification +
+ c * Content Quality +
+ d * Cost + e* Language of Learning + f * Learning Format +
+ g * Flexibility and Usability + h * Community and Support +
+ I * Innovation and Technology.

Criterion Code	Title	Priority vector
Factor 1. Content		
C1	Course Content and Topics	a = 0,572*0,648=0,370
C2	Accreditation and Certification	b = 0,131
C3	Content Quality	c = 0,070
Factor 2. Accessibility		
C4	Cost	d = 0,303
C5	Language of Learning	e = 0,051
Factor 3. Learning		
C6	Learning Format	f = 0,034
C7	Flexibility and Usability	g = 0,021
C8	Community and Support	h = 0,013
C9	Innovation and Technology	I = 0,006

The 3rd stage. Comparison of Quality Assessments of All Possible Alternatives for Each Element of the Hierarchy

MATRIX OF PRIORITY ON ALTERNATIVES TO CHOICE OF ONLINE PLATFORMS

Content and Topics	A	B	C	Priority
A	1.000	3.000	5.000	0.633
B	0.333	1.000	3.000	0.260
C	0.200	0.333	1.000	0.106
SUM	1.533	4.333	9.000	

Learning Format	A	B	C	Priority
A	1.000	4.000	6.000	0.658
B	0.250	1.000	5.000	0.262
C	0.167	0.200	1.000	0.080
SUM	1.417	5.200	12.000	

Accreditation and Certification	A	B	C	Priority
A	1.000	4.000	8.000	0.668
B	0.250	1.000	7.000	0.271
C	0.125	0.143	1.000	0.060
SUM	1.375	5.143	16.000	

Flexibility and Usability	A	B	C	Priority
A	1.000	7.000	8.000	0.751
B	0.143	1.000	4.000	0.181
C	0.125	0.250	1.000	0.069
SUM	1.268	8.250	13.000	

Content Quality	A	B	C	Priority
A	1.000	5.000	3.000	0.588
B	0.200	1.000	6.000	0.298
C	0.333	0.167	1.000	0.115
SUM	1.533	6.167	10.000	

Community and Support	A	B	C	Priority
A	1.000	3.000	5.000	0.572
B	0.333	1.000	9.000	0.354
C	0.200	0.111	1.000	0.075
SUM	1.533	4.111	15.000	

Cost	A	B	C	Priority
A	1.000	8.000	5.000	0.707
B	0.125	1.000	4.000	0.201
C	0.200	0.250	1.000	0.093
SUM	1.325	9.250	10.000	

Innovation and Technology	A	B	C	Priority
A	1.000	2.000	6.000	0.575
B	0.500	1.000	5.000	0.343
C	0.167	0.200	1.000	0.082
SUM	1.667	3.200	12.000	

Language of Learning	A	B	C	Priority
A	1.000	3.000	2.000	0.512
B	0.333	1.000	4.000	0.330
C	0.500	0.250	1.000	0.158
SUM	1.833	4.250	7.000	

Summary Matrix of the Priorities

Online platforms for non-formal education	CONTENT			ACCESSIBILITY		LEARNING				TOTAL
	Course Content and Topics	Accreditation and Certification	Content Quality	Cost	Language of Learning	Learning Format	Flexibility and Usability	Community and Support	Innovation and Technology	
A	0.23462976	0.087839823	0.03579127	0.214104927	0.03325196	0.020273475	0.01606	0.0075815	0.00319815	0.65273
B	0.09650428	0.035650357	0.02301884	0.060854941	0.01322333	0.010264435	0.003861	0.0046881	0.00190808	0.24997
C	0.03932676	0.007937667	0.01104691	0.028078575	0.00403112	0.003960645	0.001467	0.0009907	0.00045578	0.0973

The priority vector: 0,65*A+0,25*B+0,1*C

The most desirable (optimal) option is the option A for which the value of the utility function is equal 0,6527

intermediate results
the final answer

The input data of the model are the relative importance of factors and criteria, while the output is the best alternative.

The presented model has the following parameters:

1 the number of alternatives;

2 the number of hierarchy levels;

3 the number of criteria at each level;

4 the number of criteria within each of the top-level factors.

Conclusions

Non-formal education is a modern, flexible, and practice-oriented approach that supports lifelong learning.

Statistical studies of recent years have shown that the fastest growth in the number of participants in non-formal education worldwide occurred in 2020–2021 and was associated with the pandemic. In Ukraine, during 2019–2021, online platforms became a mass means of education and self-development. The second significant wave is related to the military intervention, which has necessitated the widespread use of personalized learning trajectories.

The model proposed in this study for evaluating alternatives of online platforms for non-formal education using the Analytic Hierarchy Process (AHP) is useful for organizing the process of decision-making under conditions of a growing supply of non-formal education tools.

Such a model may be useful from the perspective of organizing the educational process to identify the preferences of students and applicants regarding evaluation components and incentives during learning.

Дякую за увагу!

Thank you for your attention!