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## A UKRAINIAN BEST PRACTICE OF UNIVERSITY TRAINING BASED ON THE EUROPEAN CONCEPTION OF THE 21ST CENTURY

### Keywords

Innovative Pedagogy of 21st century - University Training - Docimology - Online Teaching -  
TeLSAC Model - Educational Psychology - Education Sciences - Education Sciences

### ABSTRACT

This paper presents the results of an innovative training experience carried out in the course *'Technological design and teamwork in teaching activities'*, held from 27 February to 30 June 2023 (2nd semester of the 2022/23 academic year) in the Department of 'Pedagogy and Innovative Education' at the Polytechnic University of Lviv (Ukraine).

The experience gained in the training course was characterised by the achievement of three innovative objectives, which make a fundamental contribution to the concepts and methods of teaching in the 21st century.

The innovative objectives pursued in the Lviv Polytechnic training course are:

- 1) experience, in a country outside the European Union, the training model **TeLSAC – Teaching/Learning by Skills for Aptitudes & Capacities** (Presutti, 2016b, 2019, 2022) adapted to the needs of young people and the educational tools of the 21st century.

The TeLSAC Model **goes beyond the traditional conception and method of 'lecturing'** used in the 20th century, basing their activities and teaching strategies on the socio-economic-cultural way of life of the 21st century Techno-Informed Society.

The TeLSAC Model pursues the following guidelines of:

- EUROPEAN UNION Countries described in the White Papers published in the 1990s, in the construction of the European Higher Education Area (EHEA) and the European Education Area (EEA), the recent creation of 'Teacher Academies' within the Erasmus + Programme to be implemented in the years 2021-2027;
- UKRAINE described in the Reforms on the *'Higher Education Reform Strategy in Ukraine'*, the *'New School'* and the *'Regulation on Certification of Teaching Staff'*. concerning innovation in teachers' training and the development of students' skills, whose basic principles were enunciated in 2014 and 2017 by the Ministry of Education and Science of Ukraine, in 2018 and 2022 by the Cabinet of Ministers of Ukraine;

- 2) Implementing "**best teaching/learning practice**" in Ukraine based on **online teaching**, whose innovative educational value takes on greater importance and significance as it was made during the Russia-Ukraine war, thus at an extremely difficult time logistically, socially, motivationally, and emotionally for the students of Lviv Polytechnic;
- 3) highlight the **ineffectiveness (and thus inadequacy) of Training based EXCLUSIVELY on online teaching/learning** (carried out by "Virtual Universities"), without there being any socialization activities among students that would allow them to compare themselves, work in groups, and communicate weekly with the teacher regarding activities and documentation of their educational path.

The documentation of "*best practices*" implemented by some Lviv Polytechnic students and online teaching activities carried out during the training course can be accessed by teachers and researchers who want to:

- (a) compare the training course and the results achieved in the course against their own experiences,
- (b) deepen the topics covered and the training processes carried out in the course,
- (c) implement the TeLSAC Model in their University.

The paper presents the following topics:

1. The guidelines of the European Union and Ukraine on teachers training in the 21st century.
2. The Training Model implemented with the students of Pedagogy of Lviv Polytechnic University
3. The Formative Pact between teacher and students of the course.
4. The innovative structure of the training course
5. The students' participation in the training course
6. The assessment of skills acquired by students in the course
7. The results of the course and the Formative Success of students.

## 1. THE GUIDELINES OF THE EUROPEAN UNION AND UKRAINE ON TEACHERS TRAINING IN THE 21ST CENTURY

From February 27 to June 30, 2023 at Lviv Polytechnic University, the training course "*Technological Design and Teamwork in Teaching Activities*" was carried out on the basis of the following defined guidelines of the European Union regarding the basic principles of teaching and training the new generations of the 21st century:

- the concepts described in the **White Papers** published in the 1990s (European Commission 1993,1995; Delors, 1996a-b; Cresson, 1996);
- the construction of the European Higher Education Area (**EHEA** - <https://www.ehea.info/>) and of the European Education Area **EEA** – <https://education.ec.europa.eu>), in which the key role of highly competent and motivated teachers and trainers in teaching is recognized;
- the recent creation of the "**Teacher Academies**" platform within the Erasmus + Program, (<https://www.erasmusplus.it/scuola/teacher-academies/>), with the aim of contributing effectively to the training of EU teachers in the years 2021-2027.  
The European platform "Teacher Academies" promotes and enhances teachers' skills needed to use technology effectively and creatively in a way that engages and motivates young people living in the Techno-Computerized Society of the 21st century.  
The main function of the "Teacher Academies" platform is to create European partnerships of teacher education and training providers in line with the policy priorities and core principles of the European Union.

At the Ukrainian level, the training course implemented in 2023 at Lviv Polytechnic is based on what was established in 2017 in the Reform on the "**New School**" defined by the MES - Ministry of Education and Science of Ukraine (L. n. 2145-VIII of Sept. 5, 2017; ESM 2017), in which is described the importance of:

- Innovating the types and methods of teaching of teachers, making them acquire educational skills and strategies in the Psycho-Pedagogical and didactic fields;
- Training teachers in the development of students' skills through the use of technological tools in the school and college education of the younger generation.

The Ukrainian Reform Law to implement the "New School" was preceded in 2014 by the development of the document on "**Higher Education Reform Strategy in Ukraine to 2020**" drafted by the Universities of Kyiv, Kharkiv and Lviv, and subsequently supervised by the Expert Group for Reform of the MES - Ministry of Education and Science of Ukraine (MES, 2015).

The main purpose of this document is to adopt a shared strategy until 2020 to implement the Reform of Ukrainian Universities in order to create an **attractive and competitive national higher education system of Ukraine, integrated into the European Higher Education Area (EHEA) and the European Research Area (ERA).**

The main goals that the Reform of Ukrainian Universities aims to achieve are:

1. Guarantee citizens' constitutional rights to free and quality Higher Education, equally competitive with private Higher Education.  
garantire i diritti costituzionali dei cittadini ad una Formazione Superiore gratuita parimenti competitiva alla Formazione Superiore privata.
2. Reorganize the Higher Education management system by:
  - de-bureaucratization, decentralization, autonomy and management responsibility of Higher Education Institutions,
  - the involvement of students and families, professional unions and professional associations of Higher Education Institutions in the decision-making process.
3. Transforming the Universities into centres of independent thinking that can train professionals and generate projects to accelerate the modernization of the country.
4. Ensure fair competition among Institutions of Higher Education as a guarantee of Higher Education of high-quality.
5. Create an appropriate link between the labour world and the Higher Education system.
6. Integrating Ukrainian Higher Education into the Global and European Educational ([http://mdu.edu.ua/wp-content/uploads/2015/01/strategiya\\_reformuvannya\\_vyshchoyi\\_osvity\\_2.0.pdf](http://mdu.edu.ua/wp-content/uploads/2015/01/strategiya_reformuvannya_vyshchoyi_osvity_2.0.pdf), p. 10).

In 2022, the Cabinet Ministers of Ukraine more defined the implementation of Ukraine's University Reform through Ordinance No. 286-6 “*Strategy for the Development of Higher Education in Ukraine for 2022-2032.*”, in which the importance of achieving the following results within this decade is highlighted:

- a) Ensure the social responsibility of Higher Education Institutions in line with European standards;
- b) Develop the values of a free and democratic Society;
- c) Improve the quality of educational and research activities in accordance with the standards of the European Higher Education Area;
- d) Ensure comparability and recognition in Europe and the World of degrees obtained in Ukraine;
- e) Increase the number of international scientific and educational cooperation projects;
- f) Raise the professional and social status of university professors and Institutions of Higher Education. (Cabinet of Ministers of Ukraine, 2022).

In addition to the above concepts, the training course conducted in 2023 at Lviv Polytechnic University took into consideration what is defined in the Decree Regulation on Certification of Teaching Personnel (CDM No. 1190-2018-П of 28.12.2018, made effective by The Cabinet of Ministers of Ukraine on Dec. 27, 2018 No. 1190), formerly provided for by the Law *On Education* of 5.09.2017.

In the Decree it is stipulated that teachers may (on a voluntary basis and solely on their own initiative) **certify their professional teaching skills** (L. No. 2145-VIII/2017, On Education of September 5, 2017, Art 52, 2).

## 2. THE TRAINING MODEL IMPLEMENTED WITH THE STUDENTS OF PEDAGOGY OF LVIV POLYTECHNIC UNIVERSITY

With the intention of putting into practice and disseminating in Ukraine European concepts and legislation in line with the innovative Ukrainian pedagogical reforms presented in the previous paragraph, since 2019, the Polytechnic University of Lviv together with the I.S.P.E.F. Institute (Institute of Psychological Sciences of Education and Training in Rome - Italy) and the E.C.E. Network (European Center of Education in Rome -Italy) have held several Conferences and Seminars, in which was participated by a substantial number of teachers and professors working in various School and University Institutions in Ukraine.

The interest shown by teachers and professors in the TeLSAC Socio-Psychological model and innovative educational methodologies presented during the Conferences and Seminars enabled the establishment of a Network of Ukrainian Schools and Universities, coordinated by the Department of Pedagogy and Innovative Education of Lviv Polytechnic University.

In view of the renewal of school and university education in Ukraine outlined above, the training course "*Technological Design and Teamwork in Teaching Activities*" was conducted in the 2nd semester of the academic year 2022/23 at Lviv Polytechnic University, experimenting with a new teaching/learning mode characterized by three innovative elements to the traditional teaching concept in Ukraine:

1. the **TeLSAC training pathway** (<https://training.ispef.net>; [www.ece.ispef.net](http://www.ece.ispef.net)), structured so that students acquire and know how to use **4 multifaceted and integrated learning itineraries and the 4 Knowing** described in the European Commission White Papers of the 1990s: **Knowing How to Do, Knowing How to Be, Knowing How to Live with Others**;
2. the use of the **ON-LINE mode by the teacher**, since these currently live in Rome thousands of miles away from the university where the course is held, realizing teaching activities with videos of lectures, teaching materials sent through the Internet and constant monitoring of the work produced by students;

### 3. the students' documentation of the training course activities carried out in the course and their individual, group and collective achievements.

To obtain a positive evaluation of the activities carried out in the course, it is essential that each student:

- a) Participate in the theoretical lectures and practical activities of the course,
- b) Study, analyze and deepen the topics covered in the papers proposed by the professor, and carry out research activities on a personal and group level with classmates on course topics,
- c) Documents and knows how to expose personal work and group work done during the course.

The training course conducted in Lviv Polytechnic used the **Socio-Psycho-Pedagogical Model TeLSAC - Teaching/Learning by Skills for Aptitudes & Capacities**, which is characterized by the



European Union guidelines and formalized by Fausto Presutti (Presutti, 2016b, 2019, 2022, [www.faustopresutti.eu](http://www.faustopresutti.eu)) of the Institute of Psychological Sciences of Education and Training - I.S.P.E.F. in Rome, Italy. ([www.ispef.it](http://www.ispef.it), [www.ece.ispef.net](http://www.ece.ispef.net)).

The TeLSAC Model structures Training (*Tra*) based on a balanced personalized and contextualized educational-didactic pathway to achieve Formative Success (*FoS*) for each student and the teacher.

The structure of the educational-didactic pathway of the TeLSAC Model is:

- A) connoted by the acquisition of professional knowledge-skills-competencies composed of 4 Knowing: Knowing How to Make, Knowing How to Be, Knowing How to Know, Knowing How to Live with Others;
- B) composed of the dynamic and complementary interaction of 4 specific educational-didactic activities of Training (*Tra*), implemented through:
  1. Classroom lectures, seminars and conferences of the Learning Itinerary (*LeI*),
  2. Online Research and Monitoring (*OReM*),
  3. Group work with Professionalizing Internship activities on field (*PI*)
  4. Transcript and presentation of the training course and achievements at the individual and group level, which constitutes the Portfolio Documentation (*PoD*) of each student and teacher-led course.

The Training (*Tra*) of the TeLSAC Model enables the comprehensive development of personal aptitudes and the concrete acquisition of professional skills for the realization of Formative Success (*FoS*) in the social-economic-cultural-personal World,

The training path of the TeLSAC Model, that connotes and determines the Training (*Tra*) for Formative Success (*FoS*) for every student and teacher, is characterized by the realization of the following **magic formula**:

$$\mathbf{Tra} = \mathbf{LeI} + \mathbf{OReM} + \mathbf{PI} + \mathbf{PoD} = \mathbf{FoS}$$

where: **Tra** = Training is structured on the following educational-didactic processes



**LeI** = Learning Itinerary                      **OReM** = Online Research and Monitoring  
**PI** = Professionalizing Internship           **PoD** = Portfolio Documentation

→ to achieve **FoS** (= Formative Success) of Students and Teachers.

The TeLSAC Socio-Psycho-Pedagogical is determined by studies, research and interventions in the following three fields:

- the field of **Sciences of Didactics** characterized by Knowing-related *Skills* and specific technical *Competencies* that are acquired in the school/university environment;
- the field of **Educational Sciences**, which incorporates the previous field, characterized by the relationship between teacher and students in the relationship of Teaching/Learning during School/University activities;
- the field of **Training Sciences**, which incorporates the two previous fields, characterized by the systemic, global and multiform representation of the Aptitudes and Capacities of students, teachers and School/University Management.

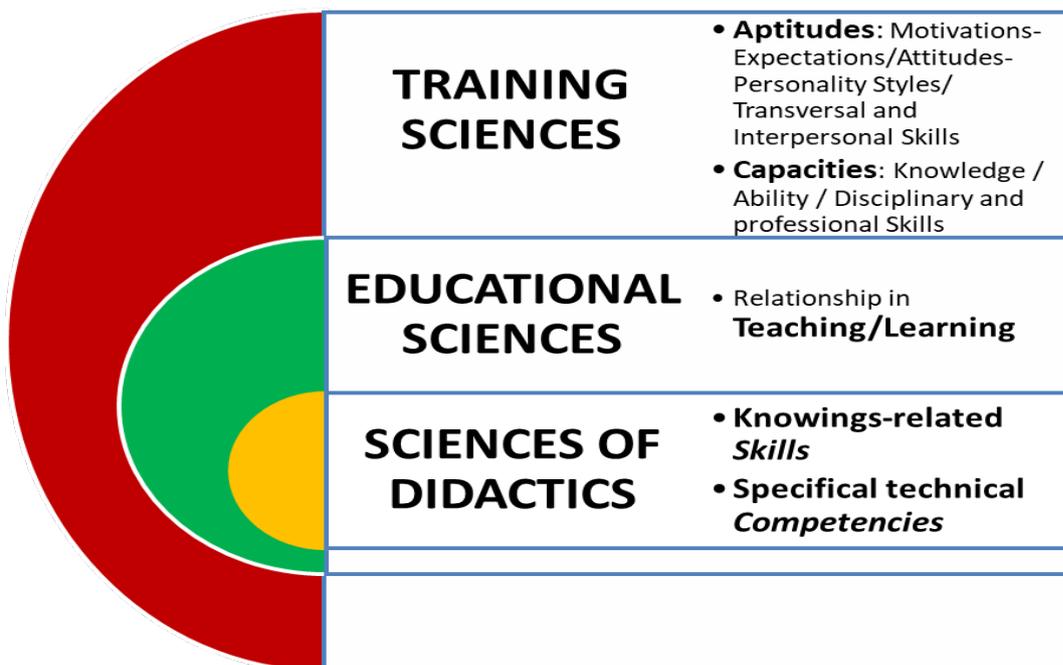


Figure 1: The activity fields of the TeLSAC model: Training Sciences, Educational Science and Sciences of Didactics

In the conception of the TeLSAC Model, teaching and learning by skills through aptitudes and capacities must be intended as part of a development process that involves the cognitive, psychological, social and professional domains of each individual, through the acquisition and use of "four pillars of Knowing" as set out in the "Report to UNESCO by the International Commission on Education for the 21st Century" (Delors, 1996, pp. 91-103):

\* **Knowing to Know and Knowing of how to Know and why Knowing,**

- \* **Knowing to Make and Knowing of how to Make and why Making,**
- \* **Knowing to Live together with Others and Knowing of how to Live together with Others and why Living together with Others,**
- \* **Knowing to Be and Knowing of how to Be and why Being,**

Thus, the TeLSAC Model is a **Socio-Psycho-Pedagogical Conception** based on the 4 Knowing's proposed by the European Union, structured as follows:

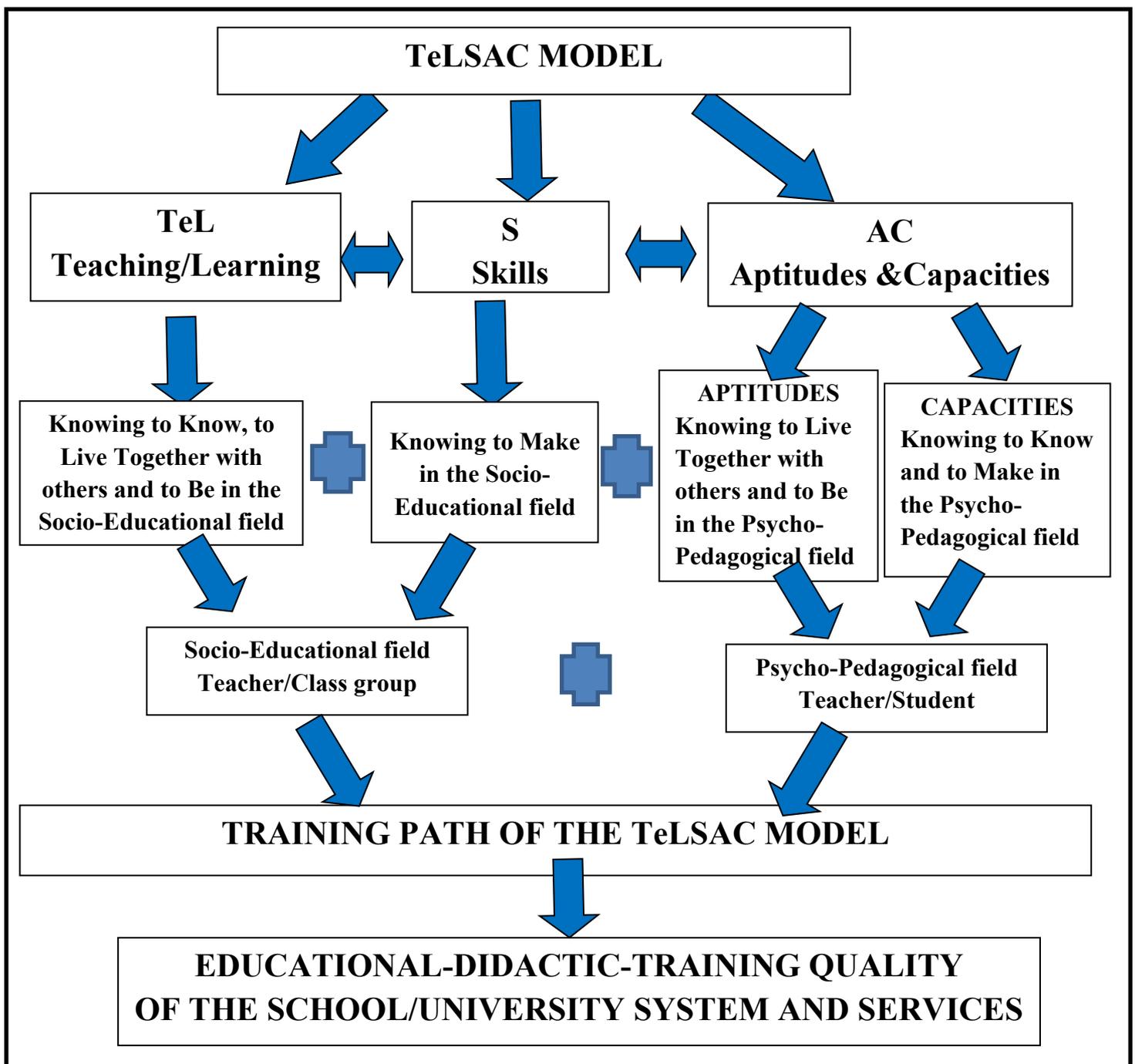


Figure 1: The TeLSAC Model comprises the 4 Knowing which define the educational-didactic-training Quality of the School/University System and Services

### 3. THE FORMATIVE PACT BETWEEN TEACHER AND STUDENTS OF THE COURSE

In the first meeting of the Lviv Polytechnic's training course, the lecturer, born and grew up in Lviv (Ukraine) but has been working for 20 years in Rome (Italy) as a researcher and lecturer in European projects, proposes and stipulates the following **training pact** with students (future teachers) in a way that makes the purpose and motivation for participation in the course clear and understandable.

The lecturer explains that the main purpose of the training course is for students to acquire innovative teaching skills and methodologies, adequate:

- to the principles and quality standards of the European Higher Education and Education Area,
- to the guidelines of School and University Reform in Ukraine.

Implementation of the training proposed in the course may make a concrete contribution to their training as future teachers, so as to make them aware of and protagonists of their role and function in the Ukrainian Society of the 21st century.

The structure and mode of implementation of the training course that carried out in the Lviv Polytechnic:

- is based on the principles and criteria of the Bologna Process, signed in 1999 by all European Union Countries (<https://education.ec.europa.eu/it/education-levels/higher-education/inclusive-and-connected-higher-education/bologna-process>), which aims to make coherent and effective university systems of Higher Education operating in Europe, promoting and developing the quality and relevance of learning and teaching processes;
- is determined by understanding and using the **TeLSAC Socio-Psycho-Pedagogical Model** (Presutti, 2019).

The TeLSAC Model, promoted and developed in Europe and Latin America and already implemented in Ukraine in 2019 in the continuing education of teachers working in the Lviv Region Schools, involves the combined implementation of lectures by the teacher, with group work by the students, enabling them to acquire the professional skills to perform the job of a teacher.

Using the TeLSAC Model, students learn knowledge, educational intervention strategies and learn how to work with technological tools commonly used in the Society of the 21st century:

1. forming a Network of Internet Communities based on the course themes,
2. having as a formative guide the lecturer in the implementation of individual, group and collegiate activities, who, although not physically present, has the opportunity to deliver lectures, coordinate groups and act as a personalized tutor for each student in the Lviv Polytechnic course.

Using the structure and training methodology of the TeLSAC Model, students learn to develop the skills of learning at the individual level and to compare both in the small group of 3/4 people and at the collegiate/assembly level, defining and describing pedagogical proposals and concrete strategies to be implemented in teaching and instructional design.

Pedagogical proposals and concrete teaching strategies developed and formulated in writing at both the individual and small group levels form the documentary products produced during the development of the course, which ultimately go to **make up each student's Professional Portfolio of Teaching Skills**.

Thus, individual, group and collegial work not only serves for the final evaluation of the training course at Lviv Polytechnic, but also enables students to build professional Portfolios documenting the skills acquired, which can be presented and understood both in Ukraine and Europe.

With this in mind, of particular relevance and significance are the documentations considered "**best practices**" because they were evaluated as original, complete, clear, coherent, and well-described works.

Documentations evaluated as "*best practices*" can be disseminated as reference examples in Ukraine and Europe in a manner by:

- building a **Community Network for Teaching Professionalism**,
- forming a **Pedagogical Bank** consisting of proposals and strategies for educational intervention, experiential examples in the use of skills in teaching and skill acquisition during student learning processes.

#### 4. THE INNOVATIVE STRUCTURE OF THE TRAINING COURSE

The innovative structure of the training course "*Technological Design and Teamwork in Teaching Activities*" implemented in the Department of Pedagogy and Innovative Education at Lviv Polytechnic University (Ukraine), has aims to go beyond traditional "*lecture-making*" activities for the benefit of:

- greater student involvement and participation,
- adequate use of technological tools for educational purposes,
- appropriate teaching/learning methodologies and strategies suited to today's 21st century Society.

The innovative course structure implemented in the Lviv Polytechnic provided that each student:

- Participate in the different training activities, listed in the following figure;
- Knows how to make the different activities coherent and comprehensive so as to achieve a unique multifaceted training course, capable of harmoniously integrating Know-How with Knowing-Being, Knowing-Knowledge and Knowing-How to Live with Others.

<b>COURSE TRAINING ACTIVITIES</b>	<b>Hours</b>
<b>Classroom Training Activities</b>	
• Lessons	30 hours
• Seminars and conferences	
• Practical lessons	45 hours
• Laboratory lessons	-
<b>Total hours of classroom training activities</b>	<b>75 hours</b>
<b>Independent out the Class Training Activities</b>	
• - Lesson preparation, revision activities based on monitoring, documentation of training and results with reports + presentation (Portfolio)	40 hours
• - Subject matter knowledge of course materials with written summary of topics + power point presentation	20 hours
• - Online Research and Community Networking Activities	15 hours
<b>Total hours of independent training activities out the class</b>	<b>75 hours</b>
<b>Total Training Activities of the course</b>	
1 university credit (UC) for every 25 hours of educational activities according to Bologna Process directions	<b>150 total hours / 6 credits</b>

Figure 3: The training activities based on the innovative structure tested in Lviv Polytechnic University (Ukraine)

The construction, implementation and validation of this innovative training course structure, whose Socio-Psycho-Pedagogical characteristics are defined and described in the TeLSAC Model, has already been tested and developed with considerable success in the following national and international Pilot Projects:

A. in Italy through the "FARE SCUOLA (MAKING SCHOOL)" Project, implemented from 1995 to 2004, funded by the Ministry of Education, University and Research of Italy, which has been piloted in several Regions and Provinces of Italy, professionally training thousands of teachers and hundreds of headmasters at all levels of education.

The main objectives of the "Making School" Project were to develop and strengthen:

- of the methodological and strategic skills in teaching for classroom management and to achieve personalized and contextualized teaching;
- of the ability to promote and develop students' personal attitudes and relationships and in the relationship with the teacher;
- in the acquisition of didactical skills in education and psycho-pedagogy. (Presutti, 2019, p.89; submitted in I.S.P.E.F. <http://discola.ispef.biz/info> , consulted on 07/18/2023).

#### B. in Europe within the following Areas:

- **the European Education Area (EEA)** through the implementation of the DI.SCOL.A. Project, carried out in the years 2005-2008, co-financed by the European Union, Leonardo da Vinci Program Prog. no. I/05/B/F/PP-154000.

The main objectives of the DI.SCOL.A. Project were:

- the construction and implementation of the European Model of Teacher Education adapted to technological and information innovations and the demands of the 21st century Society;
- the promotion of the Quality of Education in European School Institutions, through the use of criteria that identify Teacher Professionalism and the use of innovative methodologies and strategies capable of improving the Educational Success of students and the educational satisfaction of teachers;
- the establishment of a European Teaching/Learning Community on Teacher Professionalism and Students' Formative Success. (Presutti, 2019, pp.88-89)

The structure and results achieved in the DI.SCOL.A. Project can be seen on the following I.S.P.E.F. sites: 1. <http://discola.ispef.biz> ; 2. <http://discola.ispef.biz/net> (consulted on 07/18/2023).

On the I.S.P.E.F. website <http://discola.ispef.biz> the activities and results of the DI.SCOL.A. Project are presented (in EN, ES, FR, IT), and the DI.SCOL.A. European Model of Teacher Education is displayed in the languages of the 7 participating countries: Belgium (French language), Bulgaria, Greece, Ireland (English language), Italy, Spain, Romania.

The I.S.P.E.F. website: <http://discola.ispef.biz/net> displays the purpose, structure, methodology, stages and documentation carried out in the DI.SCOL.A. Project in Italian language.

In addition, funded by the European Union within the Comenius - Grundvig framework of the Socrates Program, from 2004 to 2013, training courses on "*Strategies for Student Formative Success*" and "*Educational Quality of the Learning System*" based on the TeLSAC Model were conducted in Rome and Florence (IT), geared to all teachers and managers working within the European Education Space (presented on the I.S.P.E.F. websites: <http://www.ispef.eu/nuovo2/index2013.htm>; <http://www.ispef.eu/nuovo2/rome-may-quality.htm>; <http://www.ispef.eu/nuovo2/courses-master-ispef.htm>; consulted on 18/07/2023)

Finally. from 2014 to 2019, in agreement with the Ministry of Education of Romania and in collaboration with Transylvania University of Braşov - UTBv, training courses on "*Quality of Education*" and "*Educational Management*" based on the TeLSAC Model were conducted, who have trained thousands of teachers and leaders at the Romanian preschool and school level (presented on the I.S.P.E.F. website: <http://www.ispef.biz/wordpress-RO> , consulted on 18/07/2023).

- the **European Higher Education Area (EHEA)** through the implementation of the PERFORMER Project, implemented in the years 2011-2014 in Romania, co-financed by the European Union under Contract POSDRU/86/1.2/S/62508.

The PERFORMER Project has achieved the goal of improving the provision of University Education in accordance with the criteria of the "Bologna Process" through the development of a Master's Degree Program "Psycho-Pedagogy of Childhood.", with double degree recognition (Italy - Romania), conforming to the demands of the European labour market.

The kind of innovative master's degree realized in the PERFORMER Project is based on the TeLSAC Model and is in tune with what is envisioned in both the White Papers of the European Union and the 1999 Bologna Process for the creation of a European Higher Education Area (EHEA).

The PERFORMER Project was implemented in the following 3 Universities in Romania:

- \* University "Transylvania" of Braşov - UTBv, (coordinator),
- \* University "1 Decembrie 1918" de Alba-Iulia,
- \* University "Aurel Vlaicu" de Arad. (Presutti, 2019, p.89)

The I.S.P.E.F. Institute (of Rome - IT) carried out the scientific-methodological supervision in the implementation of the TeLSAC Model, the training course, the evaluation of the results of the Master's program and the certification of the skills acquired by the students of the 3 Universities.

The Master's degree structure based on the TeLSAC Model and the results achieved in the PERFORMER Project can be viewed on the following I.S.P.E.F. websites:

[www.ispef.eu/nuovo/performer.htm](http://www.ispef.eu/nuovo/performer.htm) , <http://performer.ispef.biz/english> ,  
<http://performer.ispef.biz/english/certification> (consulted on 07/18/2023).

- the **Europe - Latin America and Caribbean (EuLAC) Area in Higher Education** (University) through the Project TO-INN - FROM TRADITION TO INNOVATION IN TEACHER TRAINING INSTITUTIONS, financed by the European Union, ERASMUS+ Programme, Capacity Building in Higher Education EAC/A04/2015, Prot. n. 573685-EPP-1-2016-1-ES-EPPKA2-CBHE-JP, realized in the years 2016-2019.

The aim of the TO-INN project was to innovate the Pedagogical Model and the Training of Professors Teaching Pedagogy in Latin America.

16 Pedagogical Universities from the following 6 Latin American countries participated in the TO-INN Project: Argentina, Bolivia, Colombia, Ecuador, Honduras, Mexico, and Paraguay.

As for Europe, Spain, Portugal, Italy, the Netherlands, England and France participated. (Presutti, 2019, p.91; presented in the I.S.P.E.F. website: [http://www.ispef.it/nuovo2/progetto\\_toinn-vo.htm](http://www.ispef.it/nuovo2/progetto_toinn-vo.htm), consulted on 07/18/2023).

These Pilot Projects have been evaluated as **European Best Practices**.

The Model of "MAKING SCHOOL" and the European Best Practices of the DI.SCOL.A. Project, the PERFORMER Project and the TO-INN Project enabled the TeLSAC Model to be defined and validated, so that it can be adequate and effective for Training in the Techno-Computerized Society of the 21st century (Presutti, 1995, 2017a-b, 2018b, 2019).

## 5. THE STUDENTS' PARTICIPATION IN THE TRAINING COURSE

This paper presents the results of the innovative training experience carried out in the course "*Technological Design and Teamwork in Teaching Activities*" held from February 27 to June 30, 2023 (2nd semester of the academic year 2022/23) in the Department of Pedagogy and Innovative Education at Lviv Polytechnic University (Ukraine).

**The students are from two courses at Lviv Polytechnic University, identified by code PC21 and PC22.**

**A total of 31 students participated in the training course, including 18 from the PC21 course and 13 from the PC22.**

To carry out the group work, the 18 students of the PC21 course were divided into **five working groups**.

To carry out the group work, the 13 students of the PC22 course were divided into **four working groups**.

The 31 students have participated in the course activities with the following frequency:

- **18 out of 31 students** (58.07 percent, the majority of the total) have attended **all or almost always** (over 80% of the total hours),
- **6 out of 31 students** (19.35%, about 1/5 of the total) attended **often times** (60-80% of total hours),
- **5 out of 31 students** (16.13%, about 1/6 of the total) attended **enough times** (40-60% of total hours):
- **2 out of 31 students** (6.45 percent of the total) attended a **few times** (less than 40 percent of the total hours).

The **constant course attendance** of the 31 students is depicted in the following graphic:

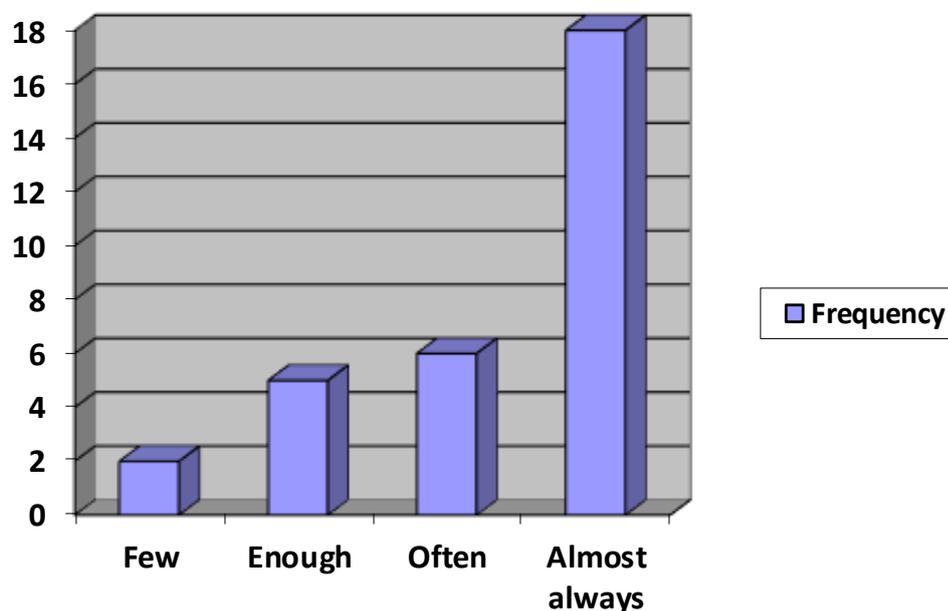


Figure 4: The representation of the frequency of student attendance at the training course activities

## 6. THE ASSESSMENT OF SKILLS ACQUIRED BY STUDENTS IN THE COURSE

The evaluation of the educational path and achievements of each student in the Lviv Polytechnic course is determined by the following scoring criteria in force in Ukrainian Universities:

- E. Score lower than 25, identified by the rating **Severely Insufficient**
- D. Score between 26 and 49 /100. identified by the rating **Insufficient.**
- C. Score between 50 and 70 /100, identified by the rating **Sufficient.**
- B. Score between 71 and 87 /100, identified by the rating **Good.**
- A. Score between 88 and 100 /100, identified by the rating **Optimal.**

In addition, an **Excellent A\* Rating** is awarded in the Lviv Polytechnic course if the student obtains a Grade with the maximum score of 100/100 and with the documentation considered a meritorious "best practice" of educational-didactic dissemination and scientific comparison.

Evaluating the documentation produced in the training course and from the results achieved by each student, which allows highlighting the skills acquired (at the

individual, group and collective level), the 31 students in the course at Lviv Polytechnic University obtained the following scores:

- **0 students have scored between 0 and 25** which corresponds to the grade **E. Severely Insufficient**;
- **2 students** (6.45%, about 1/15 attending) **have scored between 26 and 49**, which corresponds to the grade **D. Insufficient**;
- **9 students** (29.03%, about 3/10 attending) **have scored between 50 and 70**, which corresponds to the grade **C. Sufficient**;
- **5 students** (16.13%, about 1/6 attending) **have scored between 71 and 87**, which corresponds to the grade **B. Good**;
- **15 students** (48.39%, about 1/2 attending) **have scored between 88 and 100**, which corresponds to the grade **A. Optimal**.

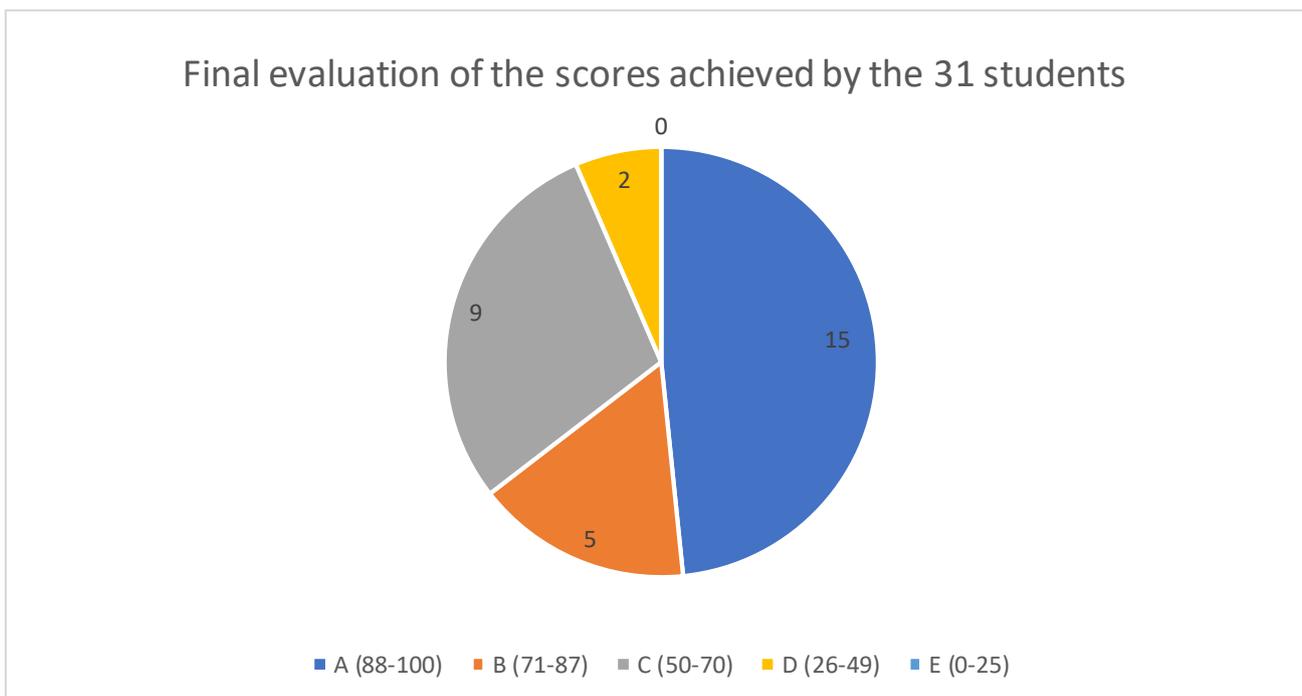


Figure 5: The graphical representation of the final grades achieved by the 31 students in the course

Evaluation of the documentation produced based on the training and achievements of the 31 students of the Lviv Polytechnic University course shows that:

**A. Almost 2/3 of the students (20 out of 31 attending, 64.52%) received a Good or Optimal rating**

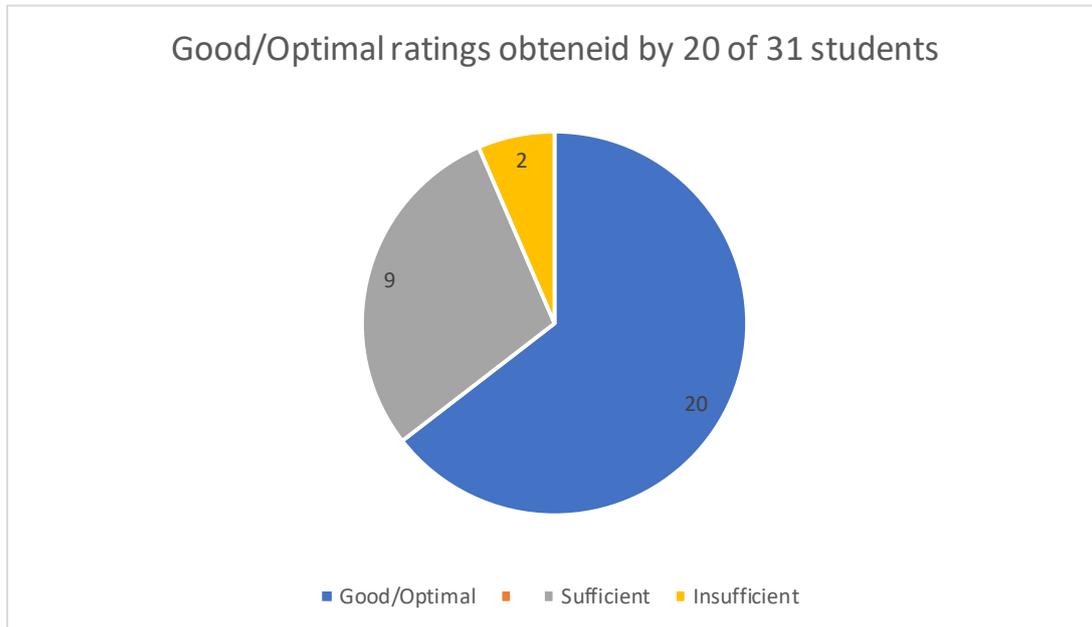


Figure 6: The graphical representation of the number of Good/Excellent ratings that can be compared with Sufficient ratings and Insufficient ratings

**B. almost all students (29 out of 31 attending, 93.55%) achieved a positive evaluation.**  
Only the 2 students (6.45%), who have attended the course very poorly, have received an Insufficient rating.

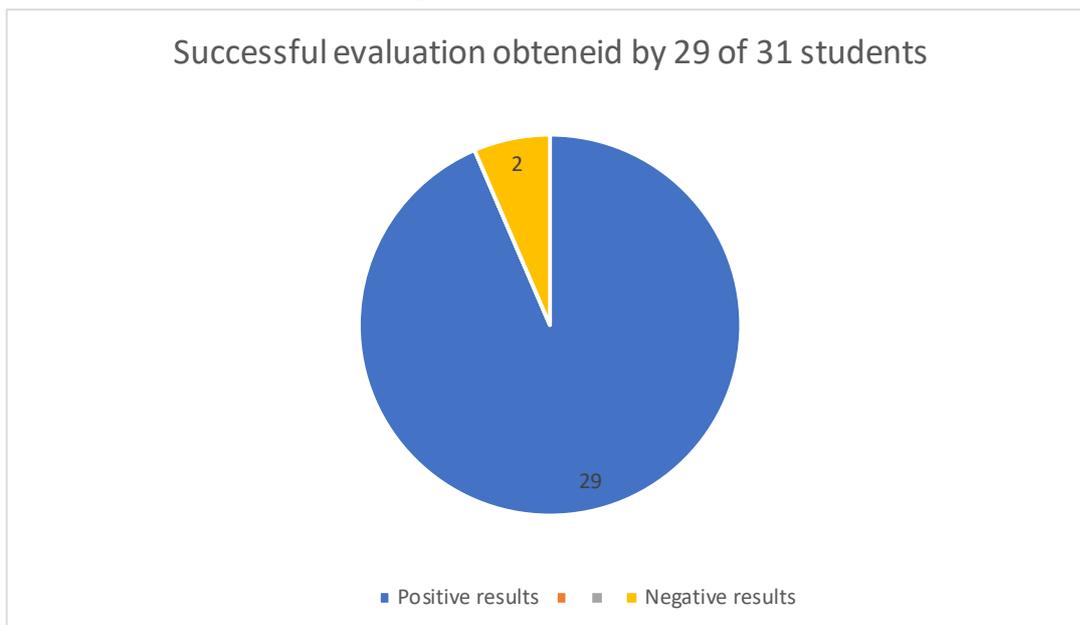


Figure 7: The graphical representation of the number of successful evaluations compared to unsuccessful evaluations of the activities carried out by the 31 students

C. **14 out of 31 attending students (45.16%, almost half of the attending students) have achieved the highest score of 100/100**, of which:

- **8 students from the PC1 course**, who were part of 3 different working groups compared to the 5 groups who worked in the PC21 course,
- **6 students from the PC22 course**, who were part of 3 different working groups compared to the 5 groups that worked in the PC22 course.

This data shows that **students belonging to 6 groups out of the total 9 groups (2/3 of the groups, 66.67 percent) achieved the highest score of 100/100.**

D. Among the 14 students who received the highest score of 100/100, as many as **9 students (29.03% of those attending) from 6 work groups earned an EXCELLENT A\* rating.**

Thus, the individual and group works of the 9 students can be considered "**Ukrainian best practices**" deserving of educational-didactic dissemination and scientific comparison.

Among the "best practices" produced by the 9 students, **2 "Ukrainian best practices" have been translated into English** (1 produced by students from the PC21 course and 1 produced by students from the PC22 course), so that they can be disseminated and comparable internationally.

## **7. THE RESULTS OF THE COURSE AND THE FORMATIVE SUCCESS OF STUDENTS**

Analysing and comparing the relationship between students' attendance in course activities and the documentation produced during the training can provide an indication for understanding how much each student's acquisition of knowledge-ability-skills depends on the group and collective work done in Lviv Polytechnic and how much instead depends on personal work done independently outside the classroom.

This indication can be analyzed and deduced by comparing the amount of attendance in the course lectures with the final score achieved by each student.

Comparing attendance in class with the grade achieved by students, the following correspondence is obtained:

- the 2 students with Insufficient outcome attended the course *few times*;
- of the 9 students with Sufficient outcome, 5 of them attended *enough times* and another 4 students *often*;
- of the 5 students with Good outcome, 2 of them attended *often* and 3 other students attended *almost always*;
- all 15 students with an Optimal outcome attended *all the time* or *almost always*.

The correlation and comparison between course attendance and final grade achieved by students are depicted in the following graph:

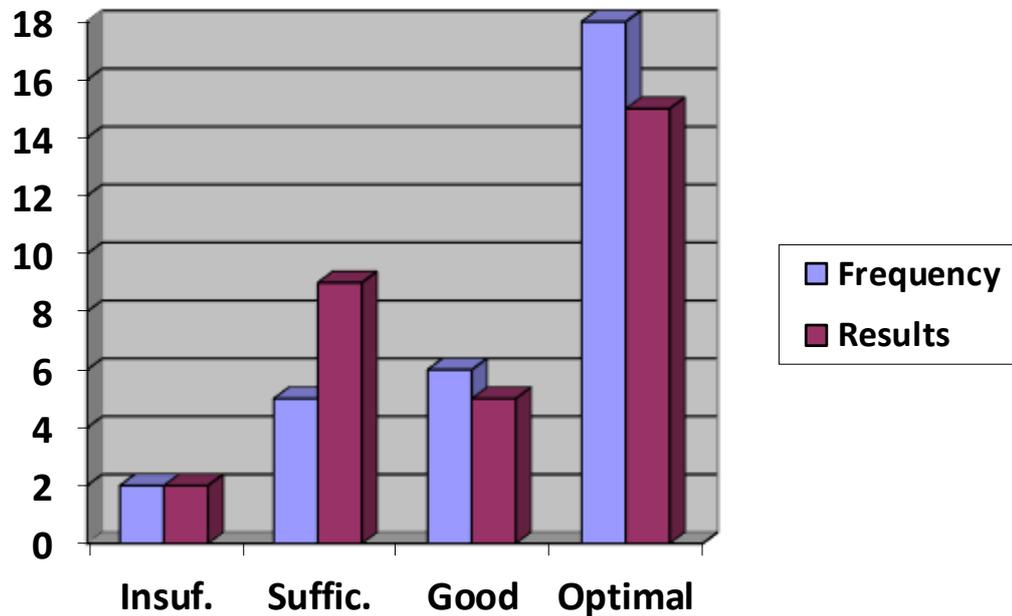


Figure 8: The representation of the comparison between the frequency of participation of the 31 students in the training course and the assessment achieved.

On the basis of the comparison between course participation and the final score achieved by students, it is evident that:

A. only the 2 students who poorly attended course activities (less than 40%) have made documentation Insufficient to obtain a Positive Evaluation.

This result shows that in order to achieve a positive outcome, the participation of students in the training is essential to develop their motivation, interests/aptitudes and to stimulate the acquisition of knowledge-ability-skills on the topics covered, even in cases where the course is conducted online by the lecturer,

B. the 9 students who were evaluated Sufficient participated in less than 80% of the training course activities.

This result corroborates the evaluation criterion within the European Union based on the principle that it is necessary and essential to participate in at least 80 percent of the training hours in order to achieve good/optimal knowledge-ability-skill acquisition on the topics covered in the course;

C. among the 18 students who participated in more than 80% of the course hours, as many as 15 students achieved a final score of 95-100 / 100.

This result shows that the TeLSAC Model is effective even when applied by the teacher using only 21st century techno-informed tools and online distance learning, thus overcoming traditional models and methods of "lesson making" in the 20th century, still used by lecturers at universities in their teaching activities of teaching.

So, based on the results achieved by the 31 students of the Polytechnic University of Lviv (Ukraine), it can be said that **the training course** (structured on the TeLSAC Model, with Online Teaching and characterized by the combination of individual, group and collective theoretical-practical activities in classroom and out-of-class) **achieved the goal of:**

- **promote and develop students' Formative Success**, demonstrated by the scores obtained and the documentation of their Portfolios; in fact:
  - 93.55% of the attending students received a Positive Evaluation,
  - 64.52% of the attending students obtained a Good-Optimal rating,
  - 45.16% of the attending students scored the highest score of 100 out of 100,
  - 9 Ukrainian "best practices" (including 2 translated into English) with Excellent A\* Ratings have been implemented, which can therefore have international dissemination.
- **begin building in Lviv Polytechnic University a Community Network and Pedagogical Bank concerning the field of Teaching Professionalism.**

In addition, the results obtained in the innovative experience of the university training course carried out in the Lviv Polytechnic University show that:

- 1) **"best teaching/learning practice" can be implemented in Ukraine based on online teaching**, whose innovative educational value takes on greater importance and significance as it was **made during the period of war** between Russia and Ukraine, thus at an extremely difficult time logistically, socially, motivationally and emotionally for the students of Lviv Polytechnic;
- 2) **the TeLSAC Model is effective in the System of Higher (University) Education in Ukraine and allows to realize a dynamic, personalized and contextualized teaching;**
- 3) **Training based EXCLUSIVELY on online teaching/learning** (carried out by "Virtual Universities") **is ineffective (and therefore inadequate) without socialization activities among students**, that enable them to engage in discussion, work in groups, and communicate weekly with the teacher regarding activities and documentation of their training pathway.

The documentation of "*best practices*" implemented by some Lviv Polytechnic students and online teaching activities carried out during the training course can be accessed by teachers and researchers who want to:

- (a) compare the training course and the results achieved in the course against their own experiences,
  - (b) deepen the topics covered and the training processes carried out in the course,
  - (c) implement the TeLSAC Model in their University.
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