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CREATIVE SKILLS IN VOCATIONAL TRAINING IN PHYSICAL EDUCATION, SPORTS AND PHYSICAL THERAPY

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Abstract

The vocational training process is a complex process which is influenced both by students' hereditary predispositions, motivation and interests and by teachers' competencies. In the process of professional training in the study programmes such as: Curricular and Leisure Time Motor Activities (CLTMA), Sports Performance (SP) and Physical Therapy in Functional Education and Re-education (PTFER) within the Faculty of Movement, Sport and Health Sciences at "Vasile Alecsandri" University of Bacau, the students of these programmes attend the course entitled Creativity Education in physical education, sport and physical therapy. The research in which we used as research methods the bibliographic study, testing, pedagogical observation, statistical and mathematical analysis, interpretation and graphic representation, was conducted on a number of 84 students, 28 from each study programme, between 5th October 2021 and 28th January 2022. In the research we used in the analysis the data resulting from the "Quantified questionnaire for the study of creative skills" and the marks obtained by students at the exam at the end of the semester. From the statistical analysis of the results recorded by the two assessment tools and by the application of the Kruskal -Wallis H non-parametric statistical test it was found that there is a statistically significant difference between the marks obtained by students in the exam and the level of creativity [H (2) = 66.196, p <0.001], differences determined by motivations, interests, concerns.

Keywords: Creativity, field, knowledge, teacher

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1. Introduction

Forming specialists in a field of university training is in accordance with the creative skills that students have for the educational - instructional process, for the chosen study program. Creative skills as well as attitudes influence development and implicitly contribute to a high level of professional training. Creativity as a psychic function of ingenuity "in sports manifests itself in different forms starting with combining the elements of an exercise, finding new solutions to tactical situations, ending with inventing new sports, procedures, exercises, devices or training methods" (Nicu, 2002, p. 22). The development of professional behavior is influenced by the experience gained which produces the adaptation of thinking and action to situations by anticipating responses and integrating them into the context of the moment. "The skills which are closely related to the estimated behavior, better predict that behavior" (Smith et al., 2005, p. 968), a behavior which evolves throughout life and ensures the manifestation of professional mastery in any field. A skill understood and accepted as "a personality acquisition, inherited and developed during life through education determines the selective orientation of the activity in relation to the current situations" (Nicu, 2002, p. 62). Skills are influenced by "creative motives that express the need for novelty and therefore orient man towards the new, they value mainly originality" (Epuran, 2005, p. 176), which in physical education and sports is undeniable. The process of evolving science is a process which includes "the discovering of new scientific problems, deriving hypotheses based on existing knowledge, designing new experiments, evaluating evidence and verifying theories" (Rodríguez et al., 2019, p. 9), but also the practical application of new ideas and theories. "Creativity is not a concept that has a simple definition, creativity is the personal desire to find an original product or solution related to what makes a person, an individual, regardless of the field in which he/she works" (Şenel & Bağçeci, 2019, pp. 216-237), to find a new way of action, of existence, of training. The factors ensuring a creative climate, in a field, "include task challenge, openness, trust among peers, expert help and group diversity, etc. However, some group issues, such as mismanagement, lack of supervisory support and student/pupil fear of teacher authority, etc., are barriers to a creative climate" (Zhou, 2018, p. 1) that need to be acknowledged and avoided. Creativity in physical education, sports and physical therapy is "a productive type of creativity which manifests itself when the most diverse modes of movement are put into practice and the most diverse motor acts and actions are combined at all levels in which the movement of the body and its segments can be performed, thus obtaining the most diverse effects".

2. Problem Statement

As the training process is constantly improving and constantly changing, which involves both the individual acquisition of theoretical information and the training of practical execution capacity (which ensures employment), we consider that the research topic is up-to-date, focused on knowledge of the level of creative skills of the students involved in the process of professional training. This knowledge accustoms teachers to an approach to the teaching-learning process according to the individual and group particularities, an aspect that conditions the training of valuable and future specialists, with creative skills in approaching the teaching process.

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3. Research Questions

The research aimed to highlight the connection between the level of creative skill and the possibilities of theoretical and practical acquisition of information. The two hypotheses were as follows: 1. “between the three study programmes (CLTMA, SP and PPTFER) there are differences in terms of students’ creative skill”; 2. “there are no significant differences between the students of the three programs in the assessment with marks of the level of creativity and the level of creative skills resulting from the appreciation test”.

4. Purpose of the Study

The purpose of our research is to know and analyse how to manifest creative skills in master’s degree students and to make a teaching process taking into account their level.

5. Research Methods

5.1. Research methods

As research methods we used as follows: bibliographic study, pedagogical observation, testing, statistical and mathematical method, result analysis and graphical representation.

5.2. Research subjects

The 84 research subjects were chosen from three study programmes: Curricular and Leisure Time Motor Activities (CLTMA), Sports Performance (PS), Physical Therapy in Functional Education and Reeducation (PTFER), 28 from each programme, from students who completed the questionnaire between 6th and 13th October 2021. The research took place between October 2021 and January 2022, at the Faculty of Movement, Sport and Health Sciences, at “Vasile Alecsandri” University of Bacau, where students from the three study programmes attended the course in Creativity Education in physical education, sport and physical therapy.

5.3. Subjects evaluation

The assessment of creative skills was appreciated by using the Quantified Questionnaire for the study of creative skills presented by Moraru (1998, pp. 172-174). The questionnaire contains 76 questions, with a maximum of 228 points. The analysis of the subjects in this questionnaire was performed according to four assessment stages, each stage being specific to a certain score. In the low skill proficiency group there are those who scored up to 57 points, in the medium skill proficiency group are those who scored between 58 and 114 points, in the good skill proficiency group there are those who scored between 115 and 171 points and in the very good skill proficiency group there are those who scored between 172 and 228 points. We eliminated 12 questionnaires, which we checked for errors in addition and which had blank fields. Subjects were asked to tick only one box for each question, the first box being scored 0 points, the second box 1 point, the third box 2 points and the fourth box 3 points.

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After completing the items, we added the points obtained in each column and the total was calculated for each student. The students' assessment was followed by the final assessment by marks recorded through a creative writing assignment at the end of the semester (January 2022). Taking into account the fact that the students of the three study programmes fall differently into the three levels of skill proficiency, we also considered it appropriate to carry out the practical applied lessons differently, depending on the specialisation. During the lessons, the students created thematic exercises according to certain criteria in order to improve their creative skill, and at the end of the semester they took the exam on the basis of a test with 20 exercises, each exercise was aimed at performing a task involving creation (Example: 1- create the simplest exercise for developing the strength of the upper limbs, 2- create based on the structure of this exercise another one adding a new movement etc.). The students performed the exercises, and we calculated the mark by awarding 0.50 points for each exercise considered correct. The highest score is 10 points.

6. Findings

Our research was conducted on a group of 84 students doing their professional training in three different programmes and in this case we will do an analysis of the level of creative skills and marks obtained in the whole group and in the three groups. Creative skill is influenced by the creative thinking that enables students to develop outstanding vocational skills, but also by the fact that the teacher insists differently on carrying out the training process in organised groups.

6.1. Analysis and interpretation of the results recorded by the group of students in terms of creative skills and exam marks

The percentage values of the level of engagement of students in creative skills and their marks, at the level of the whole group (of 84 students) can be found in Table 1 and are represented in Figure 1. What is important for the teaching process is the fact that we did not find any student who would fit in the group appreciated as low skill proficiency and under mark 5.

As it can be seen from Table 1, Figure 1, out of the 84 students who completed the questionnaire 17 students, representing 20.24% were in the group with average skill, as the percentage is below 50% of the maximum points, 53 students representing 63.10% s- they were in the group with good skill proficiency as they achieved a percentage between 51% and 75% out of a maximum of 100% and 14 students, representing 16.6%, were in the very good skill group as they achieved an individual percentage between 75.87% and 80.26%, out of a maximum of 100%. In addition, (Table 1, Figure 2), it is observed that out of the 84 students, 19 representing 22.61% were in the group that obtained marks between 5 and 6, 23 students representing 27.38% were in the group with marks between 7 and 8, and 42 students, representing 50%, were in the group with marks between 9 and 10.

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Table 1. Classification of the students in the groups according to the skill proficiency

Indicator	Low skill proficiency (under 54 points) / marks under 5	Average skill proficiency (between 58 and 114 points) / marks 5-6	Good skill proficiency (between 115 and 171 points) / marks 7-8	Very good skill proficiency (between 172 and 228 points) / marks 9-10
No. student	0	17	53	14
Percentage of skills	0	20.24%	63.10%	16.66%
No. student	0	19	2. 3	42
Percentage of marks	0	22.61%	27.38%	50.00%

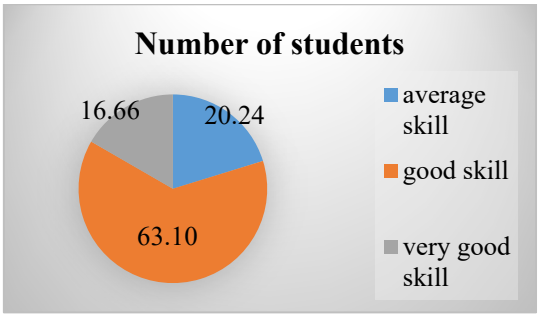

Figure 1. Graphic representation of students' engagement by skills

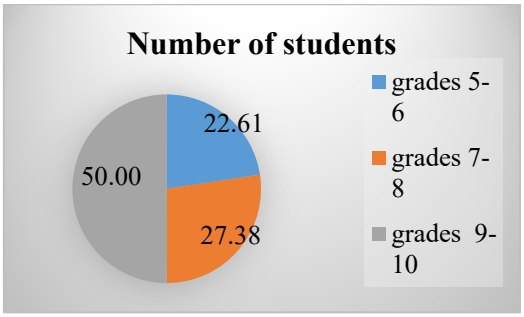

Figure 2. Graphic representation of students' grading by marks

6.2. Analysis and interpretation of the results recorded at the level of creative skills on study programmes

The outlined values of the creative skills, analysed according to the score obtained, at the level of groups on study programmes, can be found in Table 2 and in Figure 3. From the data presented in Table 2 and represented graphically in Figure 3 it is observed that there are differences in the three groups regarding the distribution of students in terms of the level of creative skills.

Out of the 28 students from the Curricular and Leisure Time Motor Activities Study Programme, 9 students representing 32.14% were in the group with average skill proficiency, as the score is below 50% of the maximum points, 14 students representing 50.00% were in the group with good skill equipment as they achieved a score of the percentage between 51% and 75% of the maximum points and only 5 students, representing 17.86%, were in the group very good skill as they achieved an individual percentage between 75.87% and 80.26%, out of maximum points

Table 2. Classification of subgroups according to skill proficiency

Subgroups	CLTMA		SP		PTFER	
	No.st	%	No.st	%	No.st	%
Skills (below 54 points)	-	-	-	-	-	-
Low skill proficiency (between 58 and 114 points)	9	32.14	5	17.86	3	10.71
Good skill (between 115 and 171 points)	14	50.00	16	57.14	22	78.57
Very good skill (between 172 and 228 points)	5	17.86	6	21.42	3	10.71
Number of students	28		28		28	
Percentage	100%		100%		100%	

CLTMA = Curricular and leisure time motor activities study programme; PS = Sports performance study programme; PTFER = Physical Therapy in Functional Education and Re-education study programme

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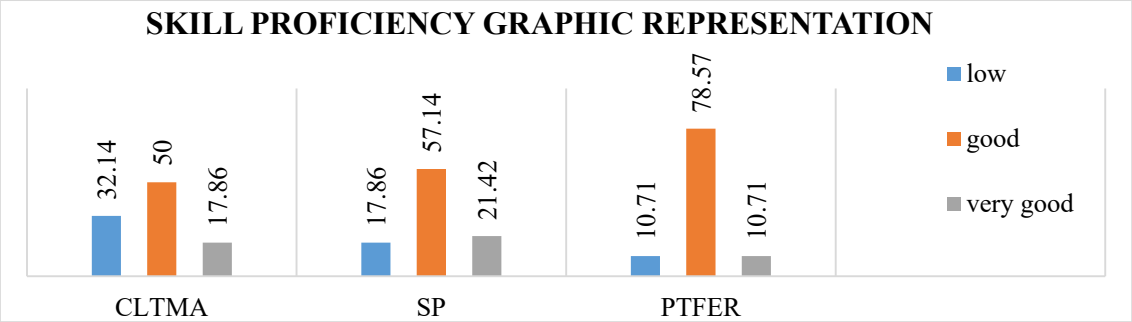

Figure 3. Skill graphic representation of students' ranking in the groups after the test

Within the group from the Sports Performance Study Programme (Table 2 and Figure 3) out of the 28 students 5, representing 17.86% were in the group with low skill proficiency, as the score is below 50% of the maximum points, 16 students representing 57.14% were in the group with average skill proficiency as they achieved a score of between 51% and 75% of the maximum of 100% and 6 students, representing 21.42%, were in the very good skill proficiency group as they achieved an individual percentage between 75.87% and 80.26%, out of a maximum of 100%.

Within the group from the Physical therapy in functional education and re-education study programme (Table 2 and Figure 3) 3 out of the 28 students, representing 10.71%, were in the group with the average skill proficiency, as the score is below 50% of the maximum points, 22 students representing 78.57% were in the group with good skill proficiency as they achieved a score of the percentage between 51% and 75% of the maximum of 100% and 3 students, representing 10.71%, were in the very good skill proficiency group as they achieved an individual percentage comprised between 75.87% and 80.26%, out of a maximum of 100%.

6.3. Analysis and interpretation of the results recorded at the level of exam marks on study programmes

Our research students are part of different training programmes, even if they are part of the same field. Given the fact that the students of the three study programmes fall differently in the three levels of proficiency of creative skill and pursue a specific professional training, we considered it appropriate both to perform different practical lessons and to record the results of the exam at end of the first semester, results recorded as a percentage in Table 3.

Table 3. The results of the evaluation with marks at the end of the first semester, on study programmes

Mark assessment	CLTMA		SP		PTFER	
	No.st	%	No.st	%	No.st	%
Marks 5-6	10	35.71	5	17.86	4	14.29
Marks 7-8	4	14.29	11	39.28	8	28.57
Marks 9-10	14	50.00	12	42.86	16	57.14
Number of students	28		28		28	
Percent	100%		100%		100%	

CLTMA = Curricular and leisure time motor activities study programme; PS = Sports performance study programme; PTFER = Physical Therapy Programme in Functional Education and Re-education

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From the data presented in Table 3 and represented graphically in Figure 4, it is observed that there are differences in the three groups regarding the distribution of students according to the marks recorded at the end of the semester.

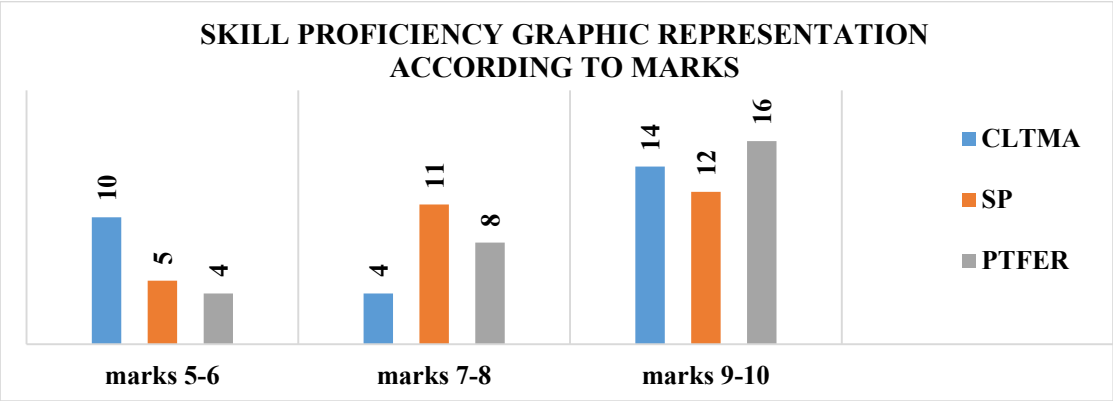

Figure 4. Graphic representation of the students' ranking in the groups regarding the marks obtained

Out of the 28 students from the Curricular and Leisure Time Motor Activities Study Programme (Table 3 and Figure 4), 10 students were included in the group with marks between 5 and 6 representing 35.72%, 4 were in the group with marks between 7 and 8 representing 14.29% and 14 students were in the group with marks between 9 and 10, representing 50.00%.

In the Sports Performance Study Programme (Table 3 and Figure 4), out of the 28 students, 5 students representing 17.86% were in the group with marks between 5 and 6, 11 students were in the group with marks between 7 and 8 representing 39.28% and 12 students, representing 42.86% were in the group who got marks of 9 and 10.

Within the group of Physical therapy in functional education and re-education study programme (Table 3 and Figure 4) out of the 28 students, 4 were included in the group with marks between 5 and 6, representing 14.29%, 8 were included students in the group with marks between 7 and 8 students representing 28.57% and there were 16 students in the group who received marks of 9 and 10, representing 57.14%.

6.4. Comparative analysis of the results recorded at the level of creative skills and exam marks on study programmes

In Table 4 we present the percentage of students' engagement both in terms of skill proficiency and in terms of grading in the exam.

Comparing the classification of the students of the three groups, in the three study programmes (Table 4 and Figure 5) in terms of creative skill, we can highlight the following facts:

i. the average creative skill proficiency with values between 58 and 119 points for the Curricular and leisure time motor activities study programme, 17.86% of students for Sports performance and 10.71% of students for the Physical therapy in functional education and re-education study

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programme, so the lowest percentage is held by students from Physical therapy in functional education and re-education study programme;

ii. the programme of good creative skill with values between 115 and 171 points is the Curricular and leisure time motor activities study programme, 57.14% of students of the Sports performance study programme and 78.57% of the students from the Physical therapy in functional education and re-education study programme and in this case the lowest percentage have the students from the Curricular and leisure time motor activities study programme,

iii. with a very good creative skill proficiency with values between 172 and 228 points, there falls with a percentage of 17.86% of the students from the Curricular and leisure time motor activities study programme, 21.42% of the students from the Sports performance study programme and 10.71% of students in the Physical therapy in functional education and re-education study programme, so the highest percentage is for the students from the Sports Performance study programme.

Table 4. The results of the percentages obtained in the skill classification and the marks obtained

Percentage of creativity test and marks obtained	CLTMA		SP		PTFER	
	A%	N%	No.st	%	No.st	%
Average skill proficiency (between 58 and 119 points) and marks between 5 and 6.	32.14	35.71	17.86	17.86	10.71	14.29
Good skill (between 115 and 171 points) and marks of 7 and 8.	50.00	14.29	57.14	39.28	78.57	28.57
Very good skill proficiency (between 172 and 228 points) and marks of 9 and 10.	17.86	50.00	21.42	42.86	10.72	57.14
Total percentage of good and very good skill equipment	67.86	64.29	78.56	82.14	89.29	86.71
Number of students	28		28		28	
Percentage	100%		100%		100%	

CLTMA = Curricular and leisure time motor activities study programme; PS = Sports performance study programme; PTFER = Physical Therapy in Functional Education and Re-education study programme, A% = Percentage of Creative Skill, N% = Percentage of Marks

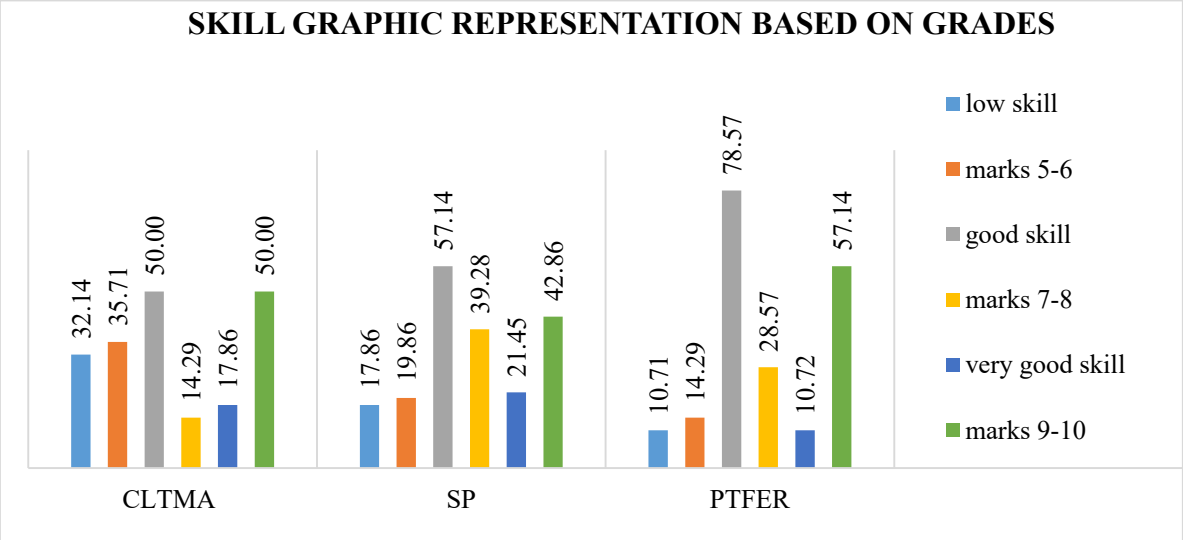

Figure 5. Graphic representation of students' placement in skill groups and marks

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Regarding the marks obtained in the exam (Table 4 and Figure 5), we can highlight the following aspects:

i. at the level of marks 5 and 6 there are 35.71% of students at the *Curricular and leisure time motor activities* study programme, 17.86% of students at *Sports performance* study programme and 14.29% of students in the Physical therapy in functional education and re-education study programme study programme, so the highest percentage is held by students from the Curricular and leisure motor activities study programme;

ii. 14.29% of the student's study at the level of marks 7 and 8 at the *Curricular and leisure time motor activities* study programme, 39.28% of the students at the *Sports performance* study programme and 28.57% of students in the *Physical therapy in functional education and re-education* study programme, so the highest percentage are students from the Sports Performance study programme;

iii. at the level of marks 9 and 10 there are 50.00% of students at the *Curricular and leisure time motor activities* study programme, 42.86% of students at *the Sports performance study programme* and 57.14% of students at the *Physical therapy in functional education and re-education* study programme, so the highest percentage is held by students from the *Sports Performance* study programme.

6.5. Statistical analysis and interpretation of the results recorded at the level of creative skills on study programmes by the Kruskal -Wallis H non-parametric statistical test and the Man- Whitney U test

In addition to the statistical analysis through the IBM ® SPSS ® programme, version 20 based on percentages and means, we also performed a statistical analysis of the results obtained by the Kruskal - Wallis H non-parametric statistical test and the Man- Whitney U test (Table 5).

Following the application of the Kruskal -Wallis H test to verify the manifestation of the students' creativity in the three study programmes, we found that the statistical results obtained [H (2) = 1,420, p> 0.05) show that the level of students' creativity differs depending on the curriculum they attend. In addition, according to the statistical results obtained, there is a statistically significant difference between the marks obtained by students in the exam and the level of creativity [H (2) = 66.196, p <0.001].

Table 5. Results of the Kruskal -Wallis H and Man- Whitney U statistical tests

Kruskal -Wallis H						
Level of creativity		**N**	**Mean Rank**	**Chi-Square (H)**	**df .**	**Asymp . Sig.**
Study programme	PTFER	28	45.82	1,420	2	p = 0.492
	PS	28	43.45			
	CLTMA	28	38.23			
Exam notes	backgrounds	19	10	66.19	2	p = 0.001
	good	22	31.66			
	very good	42	61.89			
			Man- Whitney U			
	Notes	N	Mean rank	U	Z	Asymp . Sig.

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Creativity	backgrounds	19	10	0.000	-5.471	p = 0.001
	good	22	30.50			
Creativity	backgrounds	19	10	0.000	-6.218	p = 0.001
	very good	42	40.50			
Creativity	good	22	12.66	25.50	-6.175	p = 0.001
	Very good	42	42.89			

Legend: N = number of subjects, df. = degrees of freedom, Asymp. Sig. = asymptotic significance, U = Man Whitney U, Z = Wilcoxon rank-sum test.

Therefore, we can say that, in terms of the percentage of the marks 9 and 10 obtained by students in the exam, the percentage of very good skill proficiency is higher in terms of creativity. In order to highlight these differences, we applied the Man - Whitney U test, which compared the differences between the marks obtained (average, good and very good) and the level of creativity of students as follows: the difference between the level of creativity of students with low and medium marks (U = 0.000, Z = -5.471, p <0.001); the difference between the level of creativity of students with poor and good marks (U = 0.000, Z = -6.218, p <0.001); the difference between the level of creativity of students with average and good marks (U = 25, Z = -6.175, p <0.001).

6.6. Discussions

Awareness of students' level of creative skills can stimulate teachers to find teaching-learning models to create strategies so as to increase the quality of formative education based on practical creative and critical thinking skills. Sugiyanto et al. (2018, p. 4) consider that "the creative thinking skills of high school students should be given serious attention", considering both their future professional training and their lifelong evolution. In the process of professional training, at the university level, creativity is highlighted by personalising learning experiences, by applying the specific knowledge of each discipline according to the possibilities of understanding, by the individual work rhythm, by the ability to use modern technology, by the results obtained in the exams, and it is determined by motivation, interests, etc.

The level of science development and that of the professional skills needed in the modern world is approached according to the rapid improvement of the technological process. This is evolving at a very fast pace and changing permanently the world existence. Career, professional capacity is determined by the training process that depends on the predispositions, the level of creative skills, the work done and the critical thinking in the process of obtaining education and the future evolution of each person.

7. Conclusions

By comparing the results of the creative skill test for the three programmes (CLTMA, PS and PTFER), it is observed that there are no big differences and approximately the framework dynamics is similar. The classification of good and very good skill proficiency (Table 4) at a percentage of 67.86% in the CLTMA group, of 78.56 in the PS group and of 89.29% in the PTFER group, as well as the statistical results [H (2) = 1,420, p> 0.05)] obtained by the Kruskal -Wallis H test which show that the level of creativity of the students differs according to the study programme they are following, validates the first

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hypothesis according to which *There are major differences in the three curricula* (CLTMA, SP and PTFER) *in terms of creative skill".*

The creative skills of our students influence the level of acquisition specific to the vocational training, so they play an important role in the formation of specific professional skills. Ranking students with 7 to 10 marks as good and very good skill proficiency (Table 5, Figure 5), at a percentage of 64.29% and 67.86% respectively in the CLTMA group, 82.14% and 78.56% respectively in the SP group and 86.71% and 89.29% in the PTFER group, respectively, as well as the results of the Kruskal -Wallis H test [H (2) = 66.196, p <0.001] show that the percentages obtained by students at the level of the exam marks are close in value to the level of the percentages obtained at the level of creativity within the study programmes, which validates the second hypothesis according to which "*The level of creative skills assessed by marks and the level of assessment at the exam assessed by marks has close percentage values in the study programmes."*

It is easy to see that in the CLTMA study programme the percentage of marks between 7 and 10 is lower than the percentage registered in the skill proficiency, which entitles us to consider that the students' effort in this study programme during the exam did not rise to the real possibilities, but also the fact that the percentage of marks between 7 and 10 is higher than the percentages recorded in the skill proficiency for vocational training programmes from SP and PTFER, which shows their concern for vocational training.

This research has limits, determined by the number of students, but also possibilities to extend the research to other study programmes.

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