ISSN 2543-506X

Cognitive Science – New Media – Education | Vol. 5 [2/2018]

DOI: http://dx.doi.org/10.12775/CSNME.2018.015
Received: May 30, 2019 / Accepted: a) September 24, 2019; b) September 25, 2019

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# The influence of the distance between the teacher and a student for school grades

**Abstract.** Researches related to proxemics at the turn of the years 2013–2019 during the course of which information and communication technology (ICT) was used (studies „Digital School Proksemics", „Digital space teacher in the context of proxemics", „Programming in the context of proxemics") and teaching robotics elements during the implementation of programming, also in the context of proxemics, give the right to undertake a comparison of selected issues occurring during the research and included in the studies.

The inclusion of selected research results in one comparison, despite other research titles, does not affect the very idea of comparison. It can be noticed that both ICT as well as programming science and elements of robotics in education are issues in the field of computer science, which has become one of the priorities of teaching in Polish education.

**Keywords:** proxsemics, information and communication technology, programming, robotics, teacher – student relations, computer science, distance, sphere, school grades

## Introduction

The interest in the elements of computer science, namely information and communication technology as well as programming science, as well as the elements of robotics in education, especially in the context of prox-

emics, contributed to the research and their development in the form of monographs. In the years 2013–2019 the following books were published:

I. Proksemics of the digital school, Adam Marszałek Publishing House, Toruń 2014
II. Teacher of digital space in the context of proxemics, Adam Marszałek Publishing House, Toruń 2017
III. Learning programming in the context of proxemics, Adam Marszałek Publishing House, Toruń 2018
IV. Robotics in education in the context of proxemics (in preparation for printing).

The first book was created after the completion of the government program "Digital School". The development of the results contained in this monograph was preceded by pilot studies on a 100-person teacher population from the Bydgoszcz poviat and the cities of Włocławek and Toruń. The conclusions from the quantitative analysis made it necessary to deepen the current research in the subject and conduct a qualitative analysis. The governmental program for developing students 'and teachers' competences in the use of information and communication technologies, called the "Digital School", was carried out from April 4, 2012 to August 31, 2013. Its implementation involved 402 primary schools throughout Poland, which co-financed with a total value of almost PLN 44 million for the purchase of modern multimedia equipment. The aim of the program was also to check how to use modern technologies in youth education most effectively.

In the first survey, the questionnaire was sent directly to the teacher taking part in the deliberations of the Pedagogical Council of his school and then sent to the investigator by the director. Preliminary analysis, obtained surveys from 25 schools in the Kuyavian-Pomeranian Voivodeship (Province), which were selected and joined the implementation of the Government Program "Digital Glass", finally enabled the analysis of 333 questionnaires.

The second monograph, which was also included in the comparison, is „Teacher of digital space in the context of proxemics". More than 500 teachers from the Kuyavian-Pomeranian Voivodeship from various types of schools were covered by the survey.

The third monograph is „Learning programming in the context of proxemics", which was created as a result of the actions of the Minister of

National Education informing that by September 15, 2016, willingness to participate in the pilot implementation of programming science in formal education, based on pedagogical innovations in schools, reported 1592 school facilities from all over Poland. Signed on January 30, 2018 by the Minister of National Education, the Regulation on New curriculum of general education for a four-year general high school, five-year technical secondary school and two-year secondary school signed, contains a record reflecting key objectives and assumptions of educational reform, including development of among students of entrepreneurship and creativity as well as developing skills in the efficient use of information and communication technologies not only in the education process, but also in everyday life. This is to be done by including all subjects of information and communication technologies in the core curriculum and introducing common programming learning. The explanatory memorandum to the regulation states:

> the core curriculum takes into account postulates of the educational environment regarding the shape and content of this document, which were submitted in the course of February and June 2016 at the Ministry of National Education debates and discussions devoted to a detailed review and analysis of the current core curriculum of pre-school education and general education, such as (among others): broader inclusion in the core curriculum of particular subjects of information and communication technologies (ICT), which will enable students to learn digital competences and skills also in other subjects.

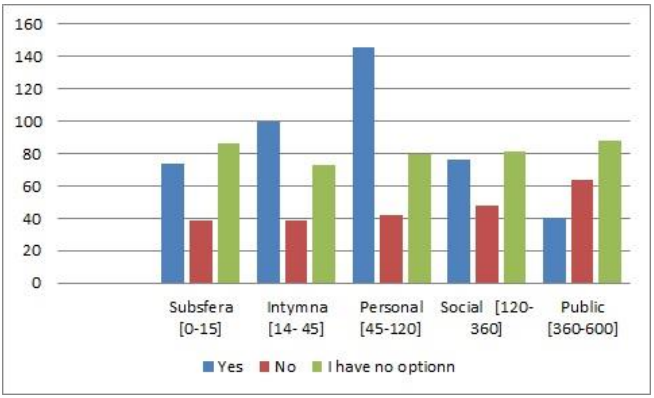
The questions that arise are: Does the distance between the teacher and the student affect the grades? And what area (distance) between the teacher and the student has a decisive impact on the positive assessment?

In the first survey, the respondents were asked whether the distance between the teacher and student in the application of information and communication technology (ICT) during classes influences the value of the student's assessments and which zone has a decisive role in receiving a positive assessment? The obtained answers are placed in the Table 1. Graphical illustration of the problem is presented in Figure 1.

**Table 1. The existence of the influence of the distance between the teacher and the student on the value of the student's assessment**

| Impact / Zone | | Yes | No | I have no opinion |
|---|---|---|---|---|
| Subsfera | [0–15] | 74 | 39 | 86 |
| Intimate | [14–45] | 100 | 39 | 73 |
| Personal | [45–120] | 146 | 42 | 80 |
| Social | [120–360] | 76 | 48 | 81 |
| Public | [360–600] | 40 | 64 | 88 |

*Source: own elaboration based on own survey data*



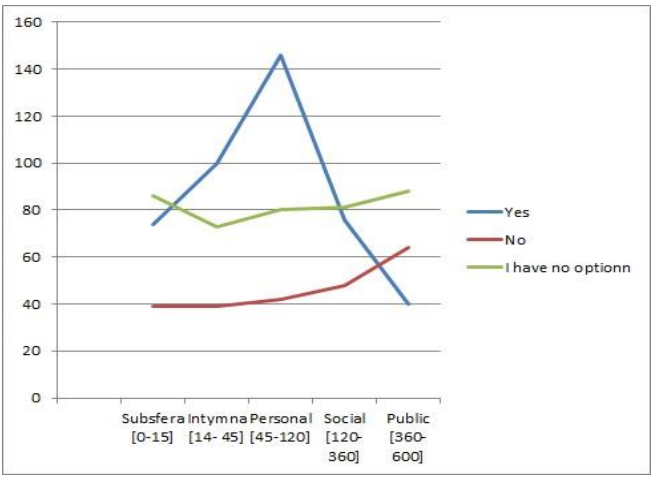




**Figure 1. Graphical presentation of results informing about the existence of the influence of the distance between the teacher and the student on the value of the positive grade obtained by the student**

*Source: own elaboration based on own survey data*

Respondents believe that the <personal> and <intimate> zone, occupied during the lesson, affect the value of the ratings. This is considered by more than 50% and 48% of respondents respectively. Some teachers, because about 35% are convinced that the effect of education in the <social> and <substream zone> areas is affected. The survey showed that in most responses, a very large percentage, about 23%, have no opinion in this problem. And it is also a different value for each zone. They did not think about it, and we should remember that the problem of learning outcomes seen from the point of view of teachers is very important in the times of the „digital school".

During the second survey, a larger number of respondents were asked for a response. The obtained result was placed in the Table 2.

**Table 2. The most frequent distance between teacher and student when working with class, group and individual classes and its impact on the value of grades – given by respondents**

| Impact / Zone | | Yes | No | I have no opinion |
|---|---|---|---|---|
| Subsfera | [0–15] | 84 | 58 | 163 |
| Intimate | [14–45] | 123 | 64 | 137 |
| Personal | [45–120] | 183 | 64 | 128 |
| Social | [120–360] | 119 | 100 | 132 |
| Public | [360–600] | 47 | 110 | 151 |

*Source: own elaboration based on own survey data*

The obtained results allow to conclude that teachers from various types of schools believe that the <personal> and <intimate> zone, occupied during the education process, affect the value of the grades. This is 48% and over 30% respectively. The group of teachers, about 23%, is convinced that the effect of learning in the <social> and <substream zone> areas is affected. A very large percentage, has no opinion in this study. Comparing the results from the presented two studies, we notice a very large convergence. Despite the different number of respondents, the proportion of the results obtained was preserved, and the obtained graphs show a large similarity. In the first study and in the second, the

biggest impact on the positive assessment obtained by the student is to occupy the <personal> and <intimate> zone by playing the main roles in education, i.e. teachers and students.

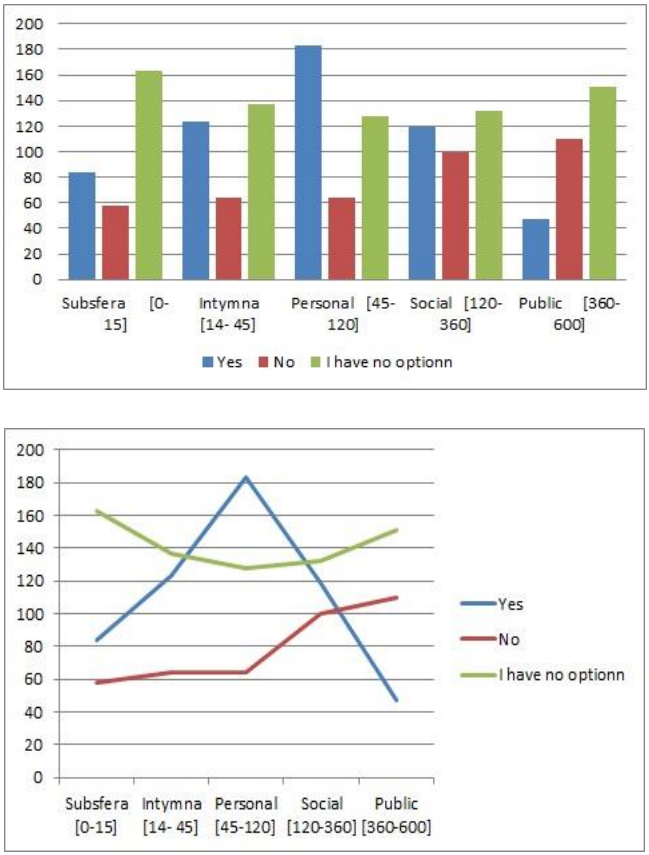



**Figure 2. Graphical representation of the results informing about the existence of the influence of the distance between the teacher and the student on the value of the student's assessment**

*Source: own elaboration based on own survey data*

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## Research during programming teaching

By joining the next survey, teachers were asked the following questions: „Does the distance between the teacher and the student during the use of ICT during learning to learn (during classes) affect the value of the student's assessment?".

The data obtained during the study show that next to the <personal> zone, which has the greatest impact on the positive assessment, the <intimate> zone is also important, the occupation of which affects the positive assessment obtained by the student. Respondents, in addition to the indicated zones, also pointed to the <social> zone as the one that also influences the student's positive assessment.

Influence of occupied zone (distance) on the obtained positive grade.

**Table 3. Numbers informing about the occurrence of the influence of the distance between the teacher and the student on obtaining a positive grade when teaching programming in a specific zone**

| Influence of occupied zone (distance) on the obtained positive grade | | **Yes** | **No** |
|---|---|---|---|
| Subsfera | [0–15] | 2 | 0 |
| Intimate | [14–45] | 17 | 1 |
| Personal | [45–120] | 54 | 8 |
| Social | [120–360] | 4 | 3 |
| Public | [360–600] | 0 | 1 |

*Source: own elaboration based on own survey data*

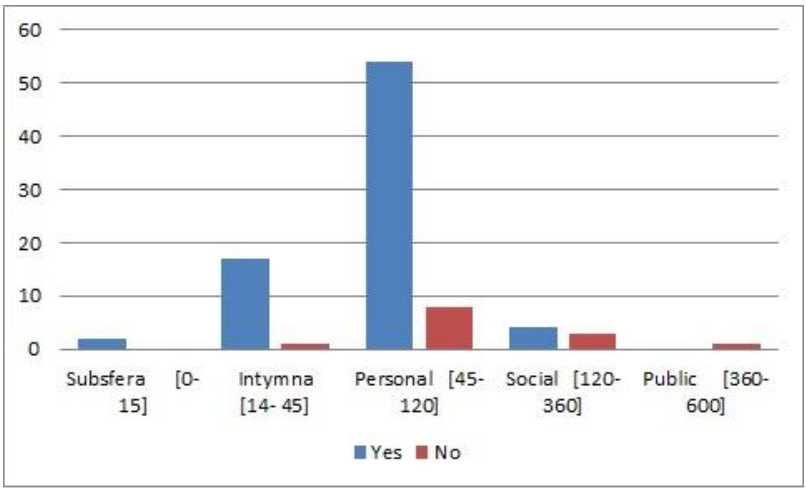


**Figure 3. Information on the influence of the distance between the teacher and the student on getting a positive grade when teaching programming**

*Source: own elaboration based on own survey data*

## The influence of distance on the student's assessment during the implementation of robotics in education

Each activity should end with a summary and evaluation, including teaching robotics during programming. The question addressed to the surveyed teachers: „Does the distance between the teacher and the student during the use of ICT while learning the elements of robotics (during classes) affect the value of the assessment (effects) of learning obtained by the student?"

The obtained answer was noted in the Table 4.

**Table 4. Numbers informing about the influence of the distance between the teacher and the student on the obtained learning outcomes (effects)**

| Is the distance between the teacher and the student ... | Number of indications | **[%]** |
|---|---|---|
| **Yes** | 178 | 32 |
| **No** | 59 | 10 |

**Table 4. Numbers informing about the influence of the distance between the teacher and the student on the obtained learning outcomes (effects)**

| Is the distance between the teacher and the student ... | Number of indications | **[%]** |
|---|---|---|
| **Sometimes** | 165 | 29 |
| **I have no opinion** | 161 | 29 |

*Source: own elaboration based on own survey data*

The obtained answers indicate that 32% of respondents say positively that the distance between the teacher and the student influences the value of the obtained (effects) grades while learning programming. In contrast, 29% of respondents believe that only sometimes the distance affects the obtained grades.

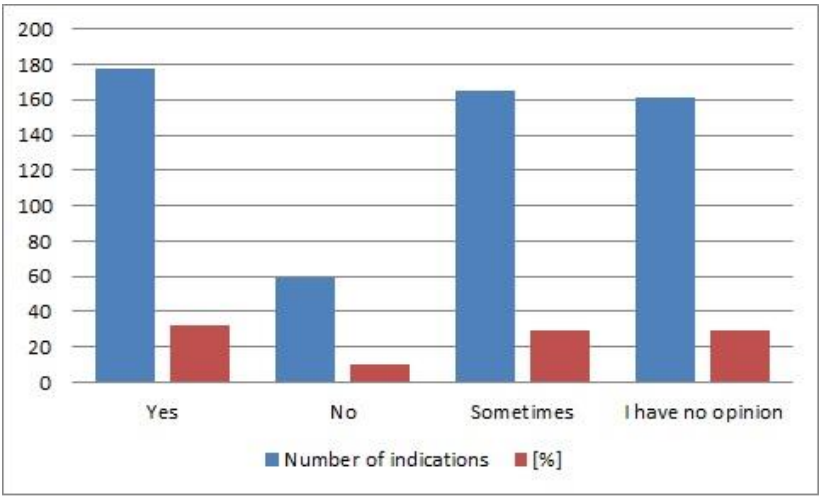


**Figure 4. Graphical presentation of the issue of the influence of the distance between the teacher and students during the use of ICT during the implementation of robotics in education on the value of the student's assessment (effects) of learning**

*Source: own elaboration based on own survey data*

Only 10% of the respondents answered <no>. However, the survey showed that about ¼ (or 161) respondents „have no opinion" on this issue. Which, however, is a disturbing indication.

## The influence of the distance on the student's positive assessment during the implementation of robotics in education

In the same study, in the next question, teachers were asked to indicate the zone (distance between the teacher and the students), which has the greatest impact on the positive grades obtained by the students.

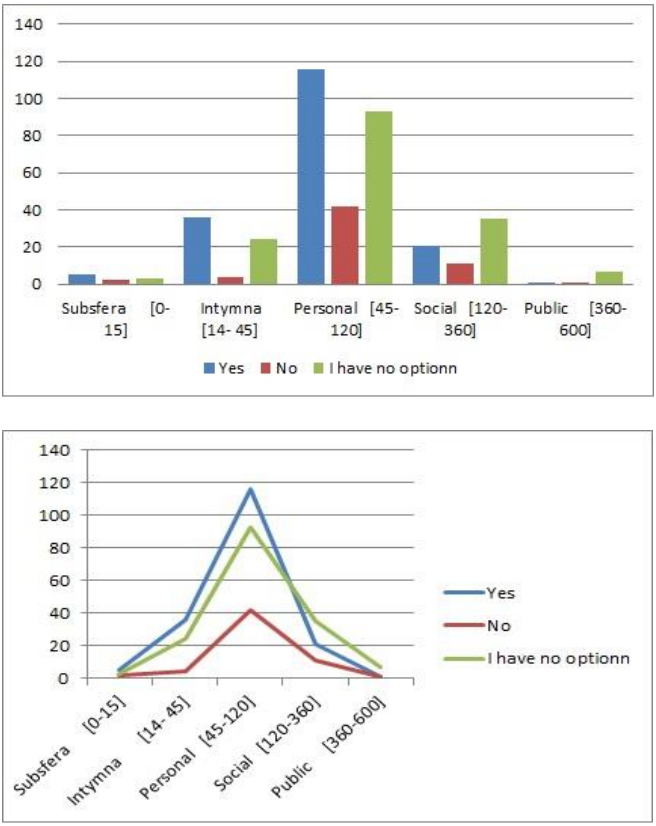


**Figure 5. Graphic presentation of results informing about the existence of the influence of the distance between the teacher and the student on the value of the student's assessment during the implementation of robotics in education**

*Source: own elaboration based on own survey data*

**Table 5. The existence of the influence of the distance between the teacher and the student on the value of the student's assessment during the implementation of robotics in education**

| Zone | Impact | Yes | No | I have no opinion |
|---|---|---|---|---|
| Subsfera | [0–15] | 5 | 2 | 3 |
| Intimate | [14–45] | 36 | 4 | 24 |
| Personal | [45–120] | 116 | 42 | 93 |
| Social | [120–360] | 21 | 11 | 35 |
| Public | [360–600] | 1 | 1 | 7 |

*Source: own elaboration based on own survey data*

Obtained results of the research also allow to notice that the <personal> zone occupied by teachers in relation to students, the most affects the positive assessment. This is what about 65% of respondents claim. Whereas the <social> and <intimate> zones have a much lesser impact on positive ratings, as indicated by 17% and 14% of respondents respectively.

**Table 6. Numbers informing about the influence of the distance between the teacher and the student on getting a positive assessment during robotics in education**

| Zone | | Number of indications | [%] |
|---|---|---|---|
| Subsfera | [0–15] | 10 | 2 |
| Intimate | [14–45] | 78 | 14 |
| Personal | [45–120] | 367 | 65 |
| Social | [120–360] | 95 | 17 |
| Public | [360–600] | 13 | 2 |

*Source: own elaboration based on own survey data*

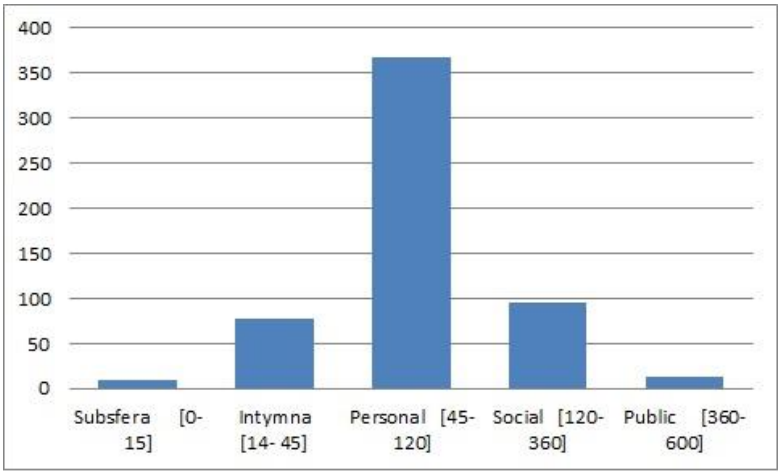


**Figure 6. Graphical representation of information on the influence of the distance between the teacher and the student on obtaining a positive grade during the robotics classes in education**

*Source: own elaboration based on own survey data*

For comparison – the results of previous research in the issue of <programming>

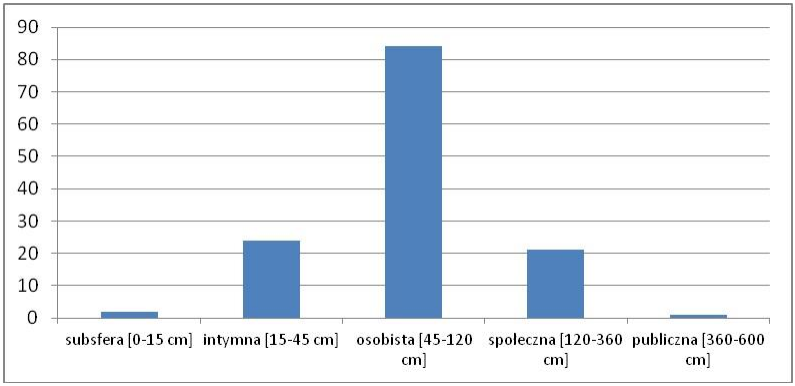


**Figure 6a. Graphical representation of information on the influence of the distance between the teacher and the student on getting a positive grade during programming teaching**

*Source: own elaboration based on own survey data*

What results from the research, which comparative graphs are presented below:

In each research group, the respondents indicated the <personal> zone as having the greatest impact on positive ratings. However, some respondents indicated with their answers that the zone occupied does NOT affect the results in education.

Both in the first and in the second survey respondents indicated that the <social> and especially <public> zones do not affect the issue included in the study. It is different in the third study, in which there were negligible cases for which NO was also indicated as a „personal" zone, as it does not affect assessment. During the fourth study, similar results were obtained as in the third study.

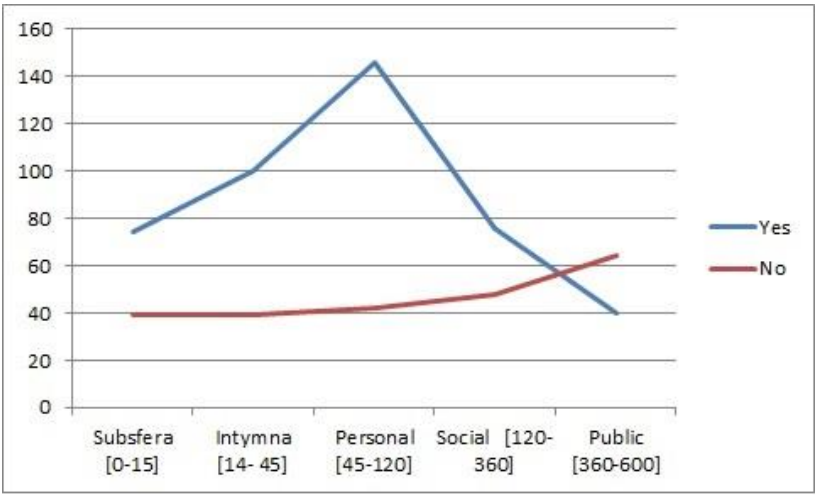


**Figure 7. Comparison of results obtained in the conducted research – I examination**

*Source: own elaboration based on own survey data*

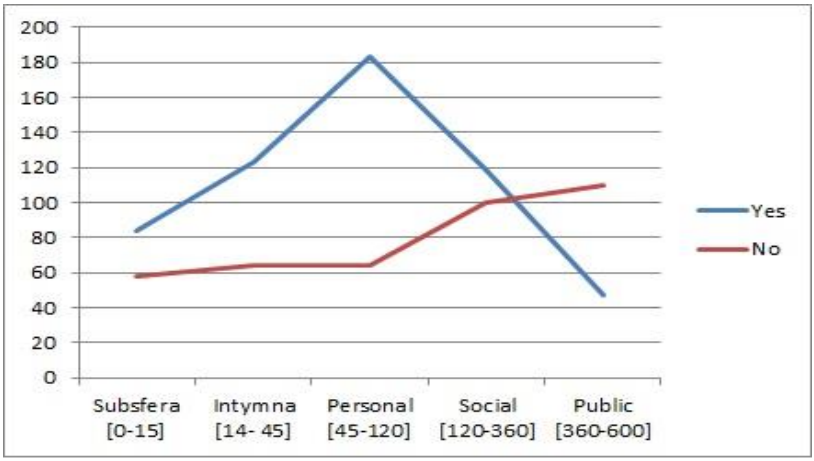


**Figure 8. Comparison of results obtained in the conducted research – II examination**

*Source: own elaboration based on own survey data*

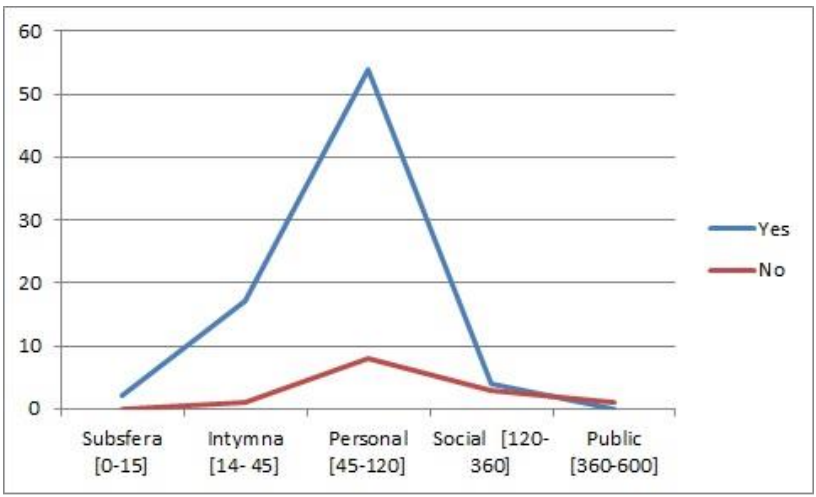


**Figure 9. Comparison of results obtained in the conducted research – III examination**

*Source: own elaboration based on own survey data*

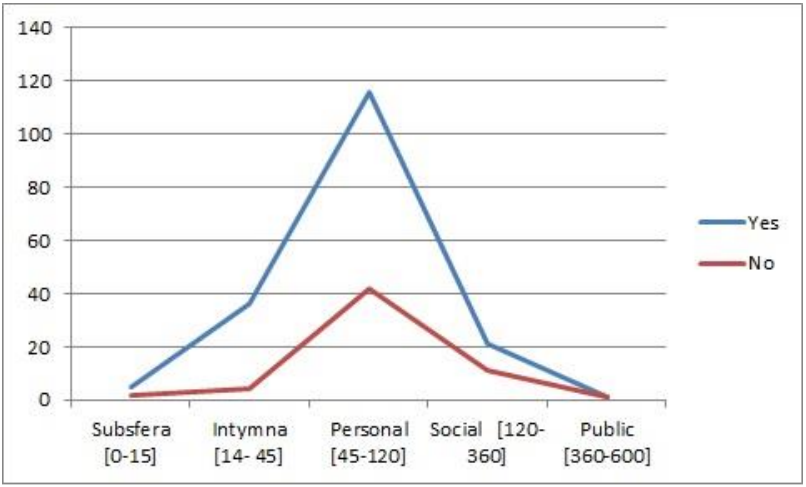


**Figure 10. Comparison of results obtained in the conducted research – IV examination**

*Source: own elaboration based on own survey data*

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