



ISSN: 2617-6548

URL: [www.ijirss.com](http://www.ijirss.com)



## Research on the value orientations of students using information and communication technologies

 Yurii Yivzhenko<sup>1\*</sup>,  Emilia Vorontsova<sup>2</sup>,  Borys Kreminskyi<sup>3</sup>,  Oleksandr Savenko<sup>4</sup>,  Valerii Illarionov<sup>5</sup>

<sup>1,2,3,4</sup>*State Scientific Institution, Institute of Education Content Modernization, Ukraine.*

<sup>5</sup>*Kyiv Electromechanical Vocational College, Ukraine.*

Corresponding author: Yurii Yivzhenko (Email: [metody@ukr.net](mailto:metody@ukr.net))

### Abstract

The current study is an attempt to compare online and offline results of research on students' value orientations. The main scientific methods and approaches used in the current research are comparative analysis, online and offline comparison and statistical rank correlation. We defined the questionnaire's content, formed its text and chose homogeneous representative groups. Results obtained both with classical (paper) technology and with information and communication technologies (ICT) are compared. The terminal and instrumental sets of values proposed by Milton Rokeach are compared. Based on the processed data, we draw conclusion about the reliability (validity) of online survey results. ICT is very helpful in conducting scientific research faster with fewer professionals involved but its time-consuming and requires numerous activities. Recommendations are given on the feasibility of using ICT in modern methods of sociological research. Work on the creation of modern research platforms, programs and algorithms that would ensure obtaining valid and informative results is prominent among the aspects of further scientific research.

**Keywords:** ICT, Measurement tool, Online, Questionnaire, Social processes, Sociological research, Students, Survey, Testing, Value orientations.

**DOI:** 10.53894/ijirss.v6i2.1499

**Funding:** This study received no specific financial support.

**History:** Received: 9 January 2023/Revised: 20 March 2023/Accepted: 4 April 2023/Published: 7 April 2023

**Copyright:** © 2023 by the authors. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

**Authors' Contributions:** All authors contributed equally to the conception and design of the study.

**Acknowledgment:** We would like to thank communal institution of higher education "Barsky Humanitarian and Pedagogical College named after Mikhail Grushevsky" for allowing the research to be conducted under their auspices and for granting ethical permission and company "Polytech SOFT", which assisted to conduct an online research.

**Competing Interests:** The authors declare that they have no competing interests.

**Transparency:** The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained.

**Ethical Statement:** This study followed all ethical practices during writing.

**Publisher:** Innovative Research Publishing

### 1. Introduction

General reforms in the education system of Ukraine are determined by striving to make it consistent with European standards along with the need to improve the quality of educational services and ensure the citizens' educational rights. The conformity of the Ukrainian education system with European standards is ensured by a wide range of legal actions. These include implementing new legislative norms in educational activities and changing the established approaches to

organization and realization. It is realized through the elaboration of modern standards for the professional training of specialists in various fields as well as the introduction of new levels and forms of education etc.

All activities related to finding out, studying, generalizing and ensuring the educational needs of citizens are determined to a great extent by their value orientations. As a result, the processes of reforming the Ukrainian education system turn out to be closely connected with deep research on students' value orientations. Moreover, the system of professional education is known to be the most massive and democratic. It can be explained by the necessity of ensuring freedom of profession. For this reason, the research of students' value orientations is crucial from the perspective of determining the right ways of reforming professional education as well as creating a system of motivation for learning.

There was a two-pillar system of professional education in Ukraine until 2017. It consisted of technical and vocational education (TVE) or professional non-higher education and professional higher education. The new version of the law of Ukraine "on education" was adopted and a separate integral component within the system of higher education was formed. It was called professional pre-higher education. This separation actually meant the creation of a three-pillar system of professional education [1].

Under such circumstances, deep research on students' value orientations is particularly relevant and essential. It is due to its direct relation to the formulation and solution of the issues that are of concern to or affect students. Being the most active citizens of Ukrainian society, they are most oriented towards practical work. Hence, they are related to the means of production, industry and all the branches that define the formation of the industrial potential of the state.

A scientific approach to problem solving involves using the appropriate methods, means and equipment along with the advancement of research in certain ways. Moreover, the research methods of various sciences can differ significantly despite having a lot of common features. For example, if math is usually aimed at finding the shortest and simplest method of solving a problem, it's considered optimal. As for physics, (which is based on the use of mathematical knowledge) it is mostly not about finding the simplest solution. Instead, preference is given to find a certain balance between the simplicity of the considered model and its compliance with real physical processes, phenomena, etc. The situation is the same when it comes to the humanities in particular the pedagogical, psychological and sociological sciences. These sciences are quite ancient and have a powerful, well-developed and balanced methodology. Modern trends in the development of science and methodology cause drastic changes. It results in a significant modernization of research methods used by the humanitarian (social) sciences, in particular pedagogics, psychology, sociology, etc.

Scientific research in such social sciences as pedagogics, psychology and sociology is traditionally related to conducting all kinds of surveys, questionnaires, tests, etc. Carrying out such research in the traditional way requires long and rather expensive preparation. It includes but is not limited to creating layouts, copying or printing the required number of papers, creating some tools for processing answers or calculating points, etc. The process of the questionnaire itself (survey, testing) and its further processing, compilation and generalization usually require a team of performers. At the same time, it does not mean that technical errors will be avoided.

After modern computer equipment and appropriate software appeared in scientific research, accordingly prospects appeared for conducting research using information resources and online resources in particular [2].

But despite the fact that the approach had its perspectives and was modern, there appeared to be some reservations, especially at the initial stage. They were related to the problems of adequate verification of survey participants, the incorrect use of ICT, etc. Later on, as registration systems improved (while maintaining the anonymity of the survey's results) and computer literacy grew considerably, the importance of such reservations decreased significantly. Hence, conducting research in this way became more attractive and relevant.

## **2. Analysis of the Latest Research and Publications on the Topic**

At the current stage, Ukrainian scientists, in particular teachers and psychologists use ICT and appropriate software widely to ensure more effective and higher quality use of existing research forms, methods and methodologies.

Scientists use ICT tools [3] while creating tests, studying the attitude of students towards testing using computer technologies [4] in the research of the dynamics of the formation of the activity component of the scientific-research competence of the teacher-researcher [5]. Spivakovsky, et al. [6] diagnosed the level of student satisfaction using the "KSU Feedback" service. Individual components of information and communication technologies were also used as a tool to increase students' motivation to study [7] as well as to increase the professional competence of future ecologists [8].

Comparing the aspects of "offline" and "online" modes of conducting research (for commercial purposes mainly) was carried out by researchers Croteau, et al. [9]. They used a practical experiment and tested the differences between "paper" and "electronic" survey forms with employees of a large organization. Respondents stated that "electronic" surveys were easier to use and more enjoyable than "paper" ones. However, paper questionnaires turned out to be effective due to a larger number of responses. To sum up, the data quality turned out to be equivalent in both formats [8].

Methods of data collection using an electronic survey tool were studied by Magro, et al. [10]. In the course of conducting the research, all the respondents were divided into four groups. Active and passive administrative approaches were used for this purpose. Two groups were offered some awards (the first two groups did not receive an award). No significant difference between active and passive management was found.

Boyer, et al. [11] compared the responses of internet content consumers at a big company who submitted answers to questionnaires both electronically and using traditional paper methods. In order to evaluate electronic surveys' effectiveness compared to traditional printed ones, two levels of analysis were conducted. These are at the micro- and macro-level respectively. The micro level provides an opportunity to examine potential advantages and disadvantages of

electronic data collection. Electronic surveys resulted in fewer missed responses, offering the possibility of being coded and presented more flexibly. It gives researchers new opportunities.

Response rates, response time and cost of postal and electronic surveys are essential to research [12]. Mail surveys have a higher response rate and a lower percentage of undelivered surveys. However, responses were significantly faster for those delivered electronically. The costs related to distributing surveys and preparing data for analysis were significantly lower in the case of electronic surveys.

Different survey methods are applied in research including those used in e-commerce. It affects the sensitivity of survey results to the measurement tool [13]. When comparing several survey modes, internet surveys turn out to be an alternative to more expensive methods of collecting information, for instance, phone and mail. Controlled experiments have shown that e-commerce survey topics are sensitive to the measurement tool especially the web-based survey. Therefore, a careful methodology development is important for the stage of interpretation of survey results related to e-commerce.

Attention should be paid to the research design and conditions, namely a randomized controlled trial within the framework of a university residency program in internal medicine [14]. By randomizing residents and teachers to an electronic and postal survey, the response rate, response time and quality of the received data were tested. Electronic surveys did not outperform postal surveys in terms of response rates but they resulted in shorter survey times and an equivalent quality of the data obtained.

Various factors influence the development and implementation of electronic questionnaires for household surveys. These are: the choice of an electronic data collection platform; questionnaire coding and translation into local languages and adaptation to the context. They include the selection of the data collectors and their training using a standardized manual; piloting tools on the ground and finalizing questionnaires. Unreliable internet connections and problems with data management and analysis have an impact as well [15]. Therefore, it is necessary to follow the elaborated methods. This is the way to prepare for and successfully conduct electronic data collection including ensuring the adaptation of tools to the local context.

Research interest is based on awareness of the importance of the professional value sphere formation of the individual, its components as well as research relevance and social demand. The current research focuses on the study of students' value orientations and the comparison of various aspects of the possible use of a variety of forms and methods of conducting surveys and other sociological studies is valuable from a modern perspective. It is for the purpose of developing and approving methodologies for the effective use and adaptation of the existing professional methods of psychological, pedagogical, sociological and other studies on a modern information and communication background.

### **3. Theoretical Framework of Research**

The new version of the law of Ukraine on education introduced a number of significant changes to the system of professional education in Ukraine. The changes were not understood and accepted immediately by educational services. In particular, in accordance with the previous norms and the terminology established, students who studied in technical schools and colleges were considered students of higher educational institutions while teachers at these institutions were considered staff at higher educational institutions. At the same time, the introduction of the concept of professional pre-higher education at the subjective level was initially perceived in society as a certain lowering of the social status of education. The latter was provided by the same institutions in conditions where the actual requirements for the content and quality of education increased.

Higher education as a factor of social status has traditionally been very high in Ukrainian society. There were misunderstandings of the requirements of the law and a certain lack of acceptance in Ukrainian society. It ignored the essence of reforming the professional education system. It could cause a significant decrease in the demand for the provision of vocational pre-higher education and a significant reduction in the number of potential students at the relevant education level. As a result, the entire sector of professional education would decline in the future.

To prevent possible negative trends in the environment of pre-higher education, several priority educational directions have been defined and are being actively implemented. These are the introduction of competency-based approach, education humanization and professional education formation as an integral system.

Professional education reform is aimed at the practical implementation of the competence approach in the educational process in vocational colleges. According to this approach, training goals become its specific results which make up the essence of competencies.

The content of education humanization consists of the reorientation of the educational process to student-oriented learning where students cognitive interests and needs, personality development, professional growth, socialization etc. are the main things [1].

The development of new methods and the updating of existing ones as well as mechanisms for studying the attitude of the educational process towards participants' current problems, processes and values as well as their cognitive needs and interests become vital. It is due to certain conditions that professional education reform, in addition to its implementation, requires some explanation regarding its essence. Moreover, understanding students' value orientations can significantly facilitate and make more effective their motivation processes regarding both studies and acquiring a specific profession.

As we mentioned before, the processes of society democratization in general and in education determine the importance of studying the students' opinions. It's essential to consider opinions in the process of educational reform and society's development.

Conducting research in the form of various types of surveys is important for the following reasons: Firstly, it causes the modernization of data collection technologies and reduces time and human resources. Secondly, it guarantees preserving (preferably improving) the quality of the results of research conducted by means of new methods, technologies, etc.

Using the latest ICT that are designed to reduce and simplify routine "manual" work must be balanced. Researchers need to be aware of the possible practical complications associated with the possible psychological rejection, mistrust and reluctance of survey respondents to answer honestly in conditions where their electronic gadgets can theoretically be tracked. In other situations, when the respondents could be much older people than students, they would simply be able to avoid fully-fledged participation in electronic survey for psychological reasons or because of insufficient knowledge of ICT. In any case, the use of a new approach, method etc. must be theoretically justified and practically verified.

The use of research methods, means, devices and methods is one of the basic principles of scientific research methods. They do not significantly influence the course of processes, events or the environment as a whole for the study for which they are intended [16]. In other words, while using new information and communication technologies for pedagogical research, researchers must be sure that the latest technologies they use do not distort the research and do not affect the results of the research. Such confidence must be based on quantitative assessments performed in accordance with established rules. Such assessments were made in our study, using a method based on the calculation of the Spearman rank correlation coefficient [17].

Fundamental studies of the concept of values were carried out by Milton Rokeach, the American scientist of Polish origin. They gained recognition and popularity. The scientist proposed the content and methodology for conducting the "test of value orientations". It enabled implementing the study of value into practice [18].

In terms of theory, M. Rokeach considers values to be a type of permanent belief of an individual. They are characterized by giving preference to certain goals or means of self-realization compared to others while their preferences are based on their greater significance.

According to Rokeach [18], values have the following characteristics:

- 1) The overall number of human values is rather small.
- 2) People have the same values (the same list of values) but the degree of importance of each of them differs greatly.
- 3) Values can be divided into groups (systematized).
- 4) Personal values are formed under the influence of social values, social institutions, culture, personal qualities, abilities of the individual, etc.
- 5) Values influence almost all social phenomena.

Rokeach [18] proposed to consider values by dividing them into two main groups. These are terminal and instrumental values. Terminal values (from Latin *'terminalis'* determining, final, i.e. vital) have indisputable significance in the life of every person. Instrumental values (means of achieving the goal) which reflect abilities, views, beliefs and other personal traits and qualities of a person that influence and play a significant role in one's choice of methods to achieve terminal values.

The problem of changing value orientations in society as a whole and among students has become crucial in recent decades. It is also important to study the directions and trends of these changes. In particular, the system of value orientations determines the meaningful side of personality development, it affects the attitude towards oneself and society, forms a life position and shapes the idea of professional activity. It promotes becoming a successful professional.

We measured students' value orientations using classical ("paper") technology. Our survey was conducted using a specially developed program on the "Politek-Soft" platform. The latter allows you to receive results quickly, process them and summarize students' opinions effectively.

Accordingly, the purpose of the research is to compare the results of measuring values obtained by classical ("paper") technology with survey results obtained using ICT perform calculations and draws conclusion about the correlation between the results obtained in different ways. As a result of such a comparison and analysis, draw appropriate conclusions and provide recommendations concerning the expediency of using ICT for the modernization of scientific research methods in the humanitarian sphere, in particular for measuring values.

#### **4. Research Methods**

With the goal of conducting research, we defined its main scientific-based stages.

1. In the first stage of our research, based on known and tested approaches, we defined questionnaire content and formed the text of the corresponding questionnaire as the main source of information to be researched.

2. Homogeneous representative groups were chosen and the opinions of their members were supposed to be studied. The sample for our research was from students who are getting professional education, the number of researched persons is 130 of which 98 are young men and 32 are young ladies. The age of the students was from 15 to 18 years.

The described relatively organized group of students was chosen for reasons of further possibility, convenience and correctness of conducting the same planned research twice. But different survey methods were used.

3. We conducted the research we had planned in a traditional way (paper, i.e. offline) and through online-based testing.

4. We ensured the receiving, collection and storage of information in one form but separately (offline and online) and put it into a single information database, processing and result generalization.

5. We carried out statistical processing, result comparison and analysis.



6. We performed generalizations and draw conclusion about the representativeness of the conducted research. The work resulted in recommendations as to the expediency of ICT usage for modernization of scientific research methods in the humanitarian sphere for measuring values.

## 5. Content, Organization and Course of the Work

The survey participants are asked to rank the values mentioned in the provided list. Traditional "paper" research is conducted using two sets of groups of values (terminal and instrumental) printed on paper strips. The participants are in ordinary classrooms. After reading the first list (of terminal values), the participants arrange them in order of their own significance. Then all the values are written in the form in accordance with the chosen order from the most important to the least important. Students participated in the survey on a voluntary basis. They knew that the form contained certain information concerning the survey participant such as age, gender, course and specialty. Then the same procedure is repeated for the values of the second group (instrumental values).

Later, a similar survey on value orientations was conducted using computer technologies (in the "offline" mode). To conduct similar online research, we used the "Colloquium" software environment (from "Politek-Soft").

"Colloquium" is an integrated system created according to "client-server" technology. It ensures high reliability and speed in survey processing. This system uses Firebird Server-1.5 which allows installing software packages on multiple computers and connecting them to a local network. The web version of the "Colloquium-testing" system makes it possible to conduct research using the internet. The reliability of socio-pedagogical research increases. Using such services of the program as "multiple choice", "sequence" and "correspondence", we offer questionnaires with different options for completing the tasks, arrange information in the necessary sequence, create "open-type" questions, etc.

Before conducting the online research, the participants in the survey were provided with special instructions. It explained the meaning of what and how they were asked to evaluate and provided the algorithm to perform the evaluation. Initially, the list of terminal values (i.e., the first group values) was offered. It was suggested in the instructions that students evaluate the importance of values for themselves in accordance with their views and value priorities. They were asked to distribute the values from the provided list (from 1 (very important) to 18 (not important or the least important)) respectively.

The second stage of the research was the instrumental value evaluation (i.e. the second group). The procedure was similar. The command to save data actually means the survey process is complete and there is a possibility of using the data.

The above-mentioned program ensures the performance of special research based on the mentioned method of M. Rokeach. In addition, it allows you to export the results to MS-Excel and process the research results quickly.

The main value is the one that gets the most points (the number of values in the list is 18, so the value in first place gets 18 points). Other values are represented in the counting down order. Hence, according to the results of the study, each value was determined as the arithmetic average of the scored points.

## 6. Results

According to the theoretical background, the research about determining value orientations was conducted using the methodology described by Rokeach [18]. The results of the value research are presented in tables. The results of the "offline" (i.e. "paper") research are given in Table 1 (column 3). Results of terminal value online research are given in column 4. Similarly, the results of "offline" (i.e., obtained in a traditional way) research are presented in Table 2 (column 3). The results of an online study of instrumental values are shown in column 4.

To determine the correlation of value hierarchies in studies conducted in different ways, we used a method based on the calculation of Spearman's rank correlation coefficient ( $r_s$ ) [17]. It checks the strength and direction of the correlation between two features or two hierarchies of features. Values research was carried out both times using the same sample in accordance with the requirements of the mentioned method of determining the correlation. During one month, different research methods were applied. So, there would be no time for respondents' values to change radically.

Let's consider and analyze the received data more thoroughly.

A) Calculation and analysis of correlations between hierarchies of thermal values obtained in different ways.

To achieve the task set, we will formulate the following hypotheses.

*Hypothesis  $H_0$ : The correlation between hierarchies of thermal values in "offline" and "online" formats does not differ from zero.*

*Alternative hypothesis  $H_1$ : The correlation between the hierarchies of the thermal values of surveys in "offline" and "online" formats statistically differ from zero significantly.*

The results of research and calculations are presented in Table 1.

**Table 1.**  
Research results of the terminal values

No.	Terminal values	Place in «offline» research	Place in «online» research	Difference d	d <sup>2</sup>
1	Health (Physical and mental)	1	1	0	0
2	Love (Spiritual and physical intimacy with a loved one)	2	2	0	0
3	Happy family life	3	3	0	0

No.	Terminal values	Place in «offline» research	Place in «online» research	Difference d	d <sup>2</sup>
4	Active life (Its fullness and emotional saturation)	4	5	-1	1
5	A financially secure life (No material difficulties)	5	4	1	1
6	Interesting work	6	7	-1	1
7	Having good and faithful friends	7	6	1	1
8	Freedom (Independence, independence in judgments and actions)	8	10	-2	4
9	Life wisdom (Maturity of judgment and common sense. They are achieved through life experience.	9	8	1	1
10	Personal development (Constant physical and spiritual improvement)	10	9	1	1
11	Cognition (The possibility of expanding one's education, outlook, general culture and intellectual development)	11	12	-1	1
12	Social vocation (Respect for others, the team, work colleagues)	12	11	1	1
13	Productive life (Maximum use of one's capacities, strengths and abilities)	13	13	0	0
14	Entertainment (Pleasant pastime, no responsibilities)	14	15	-1	1
15	Self-confidence (Internal harmony, freedom from internal contradictions and doubts)	15	14	1	1
16	Creativity (The possibility of creative activity)	16	16	0	0
17	The beauty of nature and art (Experiencing the beauty in nature and in art)	17	17	0	0
18	Other people's happiness (The welfare, development and improvement of other people, of entire nation, of the humanity as a whole).	18	18	0	0
Total		171	171	0	14

According to the formula (1) [17].

$$r_s = 1 - \frac{6 \sum_i (d_i^2)}{N(N^2 - 1)} \quad (1)$$

Where d is the difference between the locations of the two variables for each subject;

N is the number of places researched.

Let us calculate (2) the empirical value  $r_{ST \text{ emp}}$ :

$$r_{ST \text{ emp}} = 1 - \frac{6 * 14}{18(18^2 - 1)} = 0,985 \quad (2)$$

Based on the data in the table of critical values of the sample correlation coefficient for the levels of statistical significance  $p \leq 0.05$  and  $p \leq 0.01$  [17], we determine the critical values of  $r_{ST \text{ emp}}$  at  $N=18$ :

$$r_{ST \text{ kp}} = \begin{cases} 0,47 \text{ (at } p \leq 0,05) \\ 0,60 \text{ (at } p \leq 0,01) \end{cases} \quad (3)$$

When comparing in (3)  $r_{ST \text{ emp}}$  and  $r_{ST \text{ kp}}$ , we have that  $r_{ST \text{ emp}} > r_{ST \text{ kp}}$  for  $p \leq 0.01$ .

The obtained result allows us to reject  $H_0$  hypothesis and accept the alternative  $H_1$  hypothesis. The correlation between the hierarchies of thermal values in the two types of surveys is statistically significant at  $p \leq 0.01$ . Hence, the two hierarchies of values are close enough.

B) Similarly, we will calculate and analyze the correlation between hierarchies of instrumental values obtained in different ways.

To achieve the task, we formulate the following hypotheses:

*Hypothesis  $H_0$ : Correlations between hierarchies of instrumental values in "offline" and "online" formats do not differ from zero.*

*Alternative hypothesis  $H_1$ : Correlations between hierarchies of instrumental values of surveys in "offline" and "online" formats are statistically significantly different from zero.*

Research results and calculations are presented in Table 2.

**Table 2.**

Research results of the instrumental values

№	Instrumental values	Place in the «offline» research	Place in the «online» research	Difference d	d <sup>2</sup>
1	Good upbringing (Good manners)	1	1	0	0
2	Independence (Ability to act independently, decisively)	2	2	0	0
3	Honesty (Truthfulness, sincerity)	3	3	0	0
4	Responsibility (Sense of debt, ability to keep one's word)	4	4	0	0
5	Self-control (Self-restraint, self-discipline)	5	5	0	0
6	Erudition (Spectrum of expertise, high level of general culture)	6	6	0	0
7	Cheerfulness (Sense of humor)	7	7	0	0
8	Tolerance (To the views and thoughts of others, the ability to forgive others their mistakes)	8	8	0	0
9	Due diligence (Self-discipline)	9	9	0	0
10	Strong will (The ability to insist on your own, not to retreat in the face of difficulties)	10	11	-1	1
11	Courage in defending your thoughts and views	11	10	1	1
12	Responsiveness (Care)	12	12	0	0
13	Breadth of views (The ability to understand someone else's point of view, to respect other tastes, customs and habits)	13	14	-1	1
14	Rationalism (Ability to think clearly and logically, make thoughtful, rational decisions)	14	13	1	1
15	Accuracy (Neatness), ability to keep things in order, order in affairs	15	15	0	0
16	Effectiveness in affairs (Hard work, productivity at work)	16	16	0	0
17	High demand (High life requirements and high expectations)	17	17	0	0
18	Irreconcilability to the shortcomings in themselves and others	18	18	0	0
Total		171	171	0	4

According to formula (4) [17], let's calculate the empirical value of  $r_{si\ emp}$ :

$$r_{si\ emp} = 1 - \frac{6 * 4}{18(18^2 - 1)} = 0,996 \quad (4)$$

Based on the data in the table of critical values for the sample correlation coefficient at different places for the levels of statistical significance  $\rho \leq 0.05$  and  $\rho \leq 0.01$  [17], we determine the critical values  $r_{si\ kp}$  at  $N=18$ :

$$r_{si\ kp} = \begin{cases} 0,47 \text{ (at } \rho \leq 0,05) \\ 0,60 \text{ (at } \rho \leq 0,01) \end{cases} \quad (5)$$

When comparing (5)  $r_{si\ emp}$  and  $r_{si\ kp}$ , we have  $r_{si\ emp} > r_{si\ kp}$  at  $\rho \leq 0.01$ .

The obtained result allows us to reject the  $H_0$  hypothesis and accept the alternative  $H_1$  hypothesis. The correlation between the hierarchies of instrumental values in two types of surveys is statistically significant at  $\rho \leq 0.01$  i.e. the two hierarchies of values are close enough. It means the results obtained in different ways are very close, they are practically identical.

## 7. Discussion

The use of ICT for conducting scientific research in the humanitarian sphere for studying and determining value orientations in the student environment is well-grounded, justified and effective.

At the same time, the analysis of the demand for and direction of such research made it possible to define a number of important development aspects of the mentioned activity.

1. On the one hand, objectivity and truthfulness of the obtained results should always be the basis of conducting research. On the other hand, methods, means and forms acceptable for conducting research under certain specific conditions should be determined.

2. The choice to obtain objective and true research results is often a separate issue. It often results in the need for separate in-depth research. It depends on the research conditions, the specifics of the respondents or the survey content. Thus, researchers need to make decisions about finding a balance between possible ways of improving the results. These include increasing (if possible) the survey sample; increasing or clarifying the questions offered to respondents; conducting repeated research with the same respondents but with a certain time interval, deliberately reformulating questions with essentially the same content but a significantly different form of presentation, etc.

It is clear that the use of ICT expands significantly the possibilities of research variability in such conditions. It facilitates the routine work of varying questions and processing data arrays.

3. It is reasonable to take into account that from a psychological perspective, people are impressed when someone finds their point of view fascinating. It is important when respondents have freedom of choice regarding answers to questions and the options for possible answers limit the content of their expressed opinions, conclusion, etc. In this case, the problem of formulating answers to questions can be considered a separate issue for discussion. It refers to give respondents the opportunity to formulate their opinions in a unique way. Later on, the results will be generalized, qualified and regulated when processing research results. Respondents could be immediately offered a fairly clear framework for formulating possible options for points of view and offered to make a choice independently only from the existing options.

It is clear that in the first case, the variety of answer options can make their systematization significantly more complicated but it will avoid the loss of certain categories of respondents' opinions, which perhaps were not taken into account by the authors of the research. In the second case, which is characterized by greater formal certainty and ease of implementation, the loss or significant distortion of part of the information is possible. It can happen due to the inconsistency of the options in the proposed answers with the respondents' valid points of view.

4. Value orientations can change. Moreover, the dynamic changes can be very different and determined by economic, socio-political and other conditions. Accordingly, conducting research concerning and determining value orientations in general and in the student environment. It is necessary to be very careful in determining the time, periods and intervals of determining value orientations. Events in the social and political life of society and other possible important and significant circumstances are to be taken into account.

5. One should be totally aware that the surveys form, content and circumstances of conduct can affect directly or indirectly the content of the answers given by the respondents. Therefore, the results of the research as a whole are affected. In this case, a survey, dedicated to the study of the value orientations of a certain category of citizens (students) will transform from scientific research into a process of the formation of certain value orientations. It belongs to a completely different category of activity and has no relation to the subject of our scientific research. As we have already mentioned, when carrying out scientific research, it is necessary to observe its principles regarding the use of research methods, means, devices, etc. All the factors mentioned above should not significantly affect its results.

## 8. Conclusion

We obtained the results of a representative sample of TVE students based on offline and online research (identical in content). The following conclusions were drawn. We managed to perform our scientific research much faster through the use of information and communication technologies. We needed fewer staff members to conduct the online research and process its results. However, the quality and content of scientific research remain relevant. Therefore, ICT is useful for conducting scientific research in the humanitarian field and this tool makes them both effective and modern.

Our research results proved the expediency of using ICT and appropriate software to organise online surveys for conducting research on value orientations prevailing in certain strata of society, etc. In particular, the integrated system and its software which were used in the research described are quite appropriate for conducting such research. They can be used by institutions of higher education. At the same time, it is advisable to take into account the aspects presented in the work, when striving for greater objectivity, information value and research efficiency.

We consider the activity of creating modern research platforms, programs and algorithms to be a promising direction for further study of value orientations. The mentioned platforms and algorithms will provide technological procedures for quick and convenient obtaining of valid and informative research results.

## References

- [1] R. Kurok, "Trends in the development of the professional pre-higher education in the modern conditions," *Professional Pedagogics*, vol. 22, no. 1, pp. 41–48, 2021. <https://doi.org/10.32835/2707-3092.2021.22.41-48>
- [2] V. Fetisov, *Computer technologies in testing: Teaching method. manual*. Nizhin: Publisher of PP "Lysenko M.M, 2011.
- [3] T. Vdovychyn, "Creation and design of tests by ICT," *Information Technologies in Education*, vol. 43, pp. 16–26, 2020. <https://doi.org/10.14308/ite000716>
- [4] V. Starosta, "Postgraduate students' attitude towards computer-based testing of learning results," *Information Technologies in Education*, vol. 82, no. 2, pp. 215–220, 2021. <https://doi.org/10.33407/itlt.v82i2.3304>
- [5] N. Biruk, "Dynamics of formation of the activity component of the research competence of the teacher-researcher," *New Technology of Navchannja*, vol. 93, pp. 22–32, 2020.
- [6] A. Spivakovsky, M. Vinnik, Y. Tarasich, V. Kutetska, O. Kuchma, and O. Panasiuk, "Diagnosis of satisfaction level of the students from the use of service "KSU feedback" in Kherson State University," *Information Technologies in Education*, vol. 22, pp. 44–56, 2015. <https://doi.org/10.14308/ite000519>
- [7] L. Matviichuk, "Information and communication technologies as tools for improving students' motivation to learning," *Information Technologies in Education*, vol. 42, pp. 52–62, 2020. <https://doi.org/10.14308/ite000715>
- [8] O. Gorobets and S. Gorobets, "Strengthening the economic component in the training of prospective ecologists as one of the ways to increase the level of their professional competence," *New Acquisition Technology*, vol. 94, pp. 110–114, 2020.
- [9] A. Croteau, L. Dyer, and M. Migue, "Print versus electronic surveys: IEEE Transactions on professional communication," *Journal of IEEE Transactions on Professional Communication (IEEE T Prof Commun)*, vol. 53, no. 3, pp. 249–259, 2010. <https://doi.org/10.1109/TPC.2010.2052852>
- [10] M. J. Magro, V. R. Prybutok, and S. D. Ryan, "Print versus electronic surveys: How survey administration can affect response in electronic surveys," *Journal Quality & Quantity*, vol. 49, pp. 2145–2154, 2015. <https://doi.org/10.1007/s11135-014-0098-4>
- [11] K. K. Boyer, J. R. Olson, R. J. Calantone, and E. C. Jackson, "Print versus electronic surveys: A comparison of two data collection methodologies," *Journal of Operations Management*, vol. 20, no. 4, pp. 357–373, 2002. [https://doi.org/10.1016/S0272-6963\(02\)00004-9](https://doi.org/10.1016/S0272-6963(02)00004-9)



- [12] D. M. Shannon and C. C. Bradshaw, "A comparison of response rate, response time, and costs of mail and electronic surveys," *The Journal of Experimental Education*, vol. 70, no. 2, pp. 179-192, 2002. <https://doi.org/10.1080/00220970209599505>
- [13] V. Vehovar, K. Lozar-Manfreda, and Z. Batagelj, "Print versus electronic surveys: Sensitivity of electronic commerce measurement to the survey instrument," *International Journal of Electronic Commerce*, vol. 6, no. 1, pp. 31–51, 2014.
- [14] E. A. Akl, N. Maroun, R. A. Klocke, V. Montori, and H. J. Schünemann, "Electronic mail was not better than postal mail for surveying residents and faculty," *Journal of Clinical Epidemiology*, vol. 58, no. 4, pp. 425-429, 2005. <https://doi.org/10.1016/j.jclinepi.2004.10.006>
- [15] S. M. Thysen *et al.*, "Electronic data collection in a multi-site population-based survey: EN-INDEPTH study," *Population Health Metrics*, vol. 19, pp. 1-14, 2021. <https://doi.org/10.1186/s12963-020-00226-z>
- [16] E. Ilin, *Psychology of individual differences*. Peterbur: Publishing House "Piter", 2011.
- [17] M. Yevtukh, M. Kulyk, E. Luzik, and T. Ilina, *Mathematical modeling in psychological and sociological research. Textbook*. Kyiv: LLC "Information Systems, 2012.
- [18] M. Rokeach, *The nature of human values*. New York: Free Press, 1973.
- [19] V. A. Yadov, *Strategy of sociological research. Description, explanation, understanding of social reality*. Moscow: Dobrosvet, 2003.