



## ACTUAL AND DECLARED ATTITUDES TOWARDS FINANCIAL RISK AMONG STUDENTS OF THE UNIVERSITY OF WARMIA AND MAZURY IN OLSZTYN

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JEL Classification: D81, D90, D91.

Key words: behavioral economics, prospect theory, risk aversion, risk seeking.

### Abstract

The article is dedicated to the issue of actual and declared attitudes toward risk among students of the University of Warmia and Mazury in Olsztyn. The research was carried out using a survey (100 questionnaires) in December 2022 as an extension of the work carried out by the students in their thesis. The survey asked respondents to identify their self-reported attitude towards risk (risk averse, risk seeker, risk neutral attitude) and then assessed their actual attitude towards risk using the certainty equivalent method, known from behavioral economics. The study had specific objectives to identify risk attitudes among students and to identify differences between their actual and declared risk attitudes. The most significant conclusions of the study are as follows. Students are not aware of their own attitudes towards risk – only about 30% of the survey sample shows a match between actual and declared attitudes. According to the actual data, risk averters respondents are 41%, those with a risk-neutral attitude 21% and risk-seekers 38%. In the case of the declared data it was respectively: 50%, 6% and 34%.

## RZECZYWISTE I DEKLAROWANE POSTAWY WOBEC RYZYKA FINANSOWEGO WŚRÓD STUDENTÓW UNIwersYTETU WARMIŃSKO-MAZURSKIEGO W OLSZTYNIE

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Kody JEL: D81, D90, D91.

Słowa kluczowe: ekonomia behawioralna, teoria perspektywy, awersja do ryzyka, poszukiwanie ryzyka.

### Abstrakt

Artykuł poświęcono zagadnieniu rzeczywistych i deklarowanych postaw wobec ryzyka wśród studentów Uniwersytetu Warmińsko-Mazurskiego w Olsztynie. Badania przeprowadzono z wykorzystaniem formularza ankiety (100 kwestionariuszy) w grudniu 2022 r. jako rozszerzenie pracy realizowanej przez studentów w ramach pracy dyplomowej. W ankiecie poproszono respondentów o zidentyfikowanie własnej postawy wobec ryzyka (awersja do ryzyka, poszukiwanie ryzyka, postawa neutralna wobec ryzyka), a następnie oceniono ich rzeczywistą postawę wobec ryzyka za pomocą metody ekwiwalentu pewności, znanego na gruncie ekonomii behawioralnej. Badanie miało na celu identyfikację postaw wobec ryzyka wśród studentów oraz zidentyfikowanie różnic między ich rzeczywistymi a deklarowanymi postawami wobec ryzyka. Najważniejsze wnioski z badania są następujące. Studenci nie są świadomi własnych postaw wobec ryzyka – tylko ok. 30% studentów wykazuje zgodność między rzeczywistymi a deklarowanymi postawami. Zgodnie z rzeczywistymi danymi respondenci unikający ryzyka stanowią 41%, osoby o postawie neutralnej wobec ryzyka 21%, a osoby poszukujące ryzyka 38%. W przypadku danych deklarowanych było to odpowiednio: 50%, 6% i 34%.

### Introduction

For young people, studying is a developmental leap, both in terms of acquiring specialized knowledge in line with the fields of study they are taking, as well as their first experience with adulthood, independent financial decisions, investments, and the risks of managing money on their own. However, their awareness of financial markets, risks, and their own attitudes toward risk are still in the process of forming, and they are just gaining knowledge about these topics. For this reason, the students are an extremely interesting research group. Upon graduation, they will form a group of young adults, active market participants, making much larger financial decisions.

The purpose of this study was to determine attitudes towards risk among students at the University of Warmia and Mazury in Olsztyn and then to determine the differences between actual and declared attitudes toward risk. A questionnaire was used to conduct the investigation. The respondent's actual attitude was determined using the theory of the certainty equivalent of a lottery, known in the field of behavioral economics, which makes it possible to determine whether the respondent manifests a risk-seeking attitude, risk-averse attitude, or risk-neutral attitude. The responses to actual attitudes were then compared with the responses from students who self-identified their attitude toward risk, declaring which attitude they thought best described their behavior.

The remainder of the paper is organized as follows. The next chapter introduces the issue of the equivalent certainty and describes attitudes toward risk on the basis of behavioral economic theory. A detailed description of the research methodology is presented in the section 'Data and methods'. The main part of the paper is a presentation of the research results, and the whole is completed with conclusions.

## **Literature Review**

Behavioral economics is one of the younger and fastest growing fields of economics. It focuses on analyzing the decision-making process and describing the behavior of market participants by appealing to the psychological basis of human nature (Camerer & Loewenstein, 2004, p. 3; Pesendorfer, 2006, p. 712), the limited cognitive capabilities of humans and the tendency to indulge in emotions and temptations (e.g., Tyszka, 2000; Kahneman, 2012). Behavioral economics departs from the fully rational model of homo-oeconomicus behavior (Thaler, 2000; Brzezicka & Wiśniewski, 2014), also taking into account the informational deficiencies of decision-makers or issues related to the learning process.

Behavioral economics also addresses the issues of bounded rationality and decision-making process under conditions of risk and uncertainty. In this area, the best known theory is prospect theory, developed by Kahneman and Tversky (1979) and its more advanced form (Tversky & Kahneman, 1992). Prospect theory is one of the most important and interesting achievements of contemporary experimental research on psychological issues related to economic theory. This model is an alternative to the classical expected utility model (von Neumann & Morgenstern, 1944), which was criticized for mismatching theoretical assumptions with the actual behavior of market actors. According to its assumptions, decisions under risk conditions are made by an individual in two stages: the editing phase and the evaluation phase (McDermott, 2001, p. 1, 20; Zaleśkiewicz, 2011, p. 104). In the editing phase, decision-makers recognize the situation. They 'record' the results as gains and losses based on a reference

point. The reference point may be a current or desired state of possession; may be known a priori; may be shaped by preferences; and it also may be revealed from behavior (Werner & Zank, 2019). In the evaluation phase, values are established for each decision prospect.

The prospect theory described above explains how individuals make decisions under risk. Through numerous experimental studies, Kahneman and Tversky analyzed the behavior and preferences of market participants. These studies confirmed the existence of numerous deviations from the classical theory of rationality. The willingness to take risks is also an individual characteristic of decision makers. Depending on the decision-making situation and the individually determined level of risk acceptance, three attitudes towards risk can be distinguished: risk seeking, risk neutrality, and risk aversion (Tyszka & Domurat, 2004; Tyszka, 2010, p. 202). Jajuga (2018, p. 19) explains these attitudes as follows: risk aversion occurs when a decision maker is willing to incur additional expenditures in order to make a higher-risk decision; risk neutrality occurs when the magnitude of the risk does not matter when making a decision; risk seeking occurs when a decision maker takes risks when he or she expects to be compensated with a risk premium.

The study of attitudes toward risk is possible using the certainty equivalent method. Certainty equivalent is used in practice to determine the utility function for money. According to Tyszka's definition (2010, p. 202), the certainty equivalent is "such a reward value for which the decision maker is indifferent (neutral) as to whether he receives this value with certainty or a given risky option". A similar definition is given by Zaleśkiewicz (2011, p. 245), according to whom the certainty equivalent is 'the amount that is still the smallest amount acceptable to balance participation in a lottery with a risky option.' Certainty equivalent means a certain utility, determined in a similar way to the expected value from a game with a risk option (Guyse, 2001, p. 83). It is important to note that the value of the certainty equivalent varies depending on what attitude toward risk the individuals have.

The certainty equivalent method has been used in prospect theory (Kahneman & Tversky, 1979), in the cumulative prospect theory of Tversky, Kahneman (1992) and in other studies to determine the parameters of this function (Rieger *et al.*, 2017). It also has many other applications, such as determining the minimum sale price, maximum purchase price (Guyse, 2001, p. 83); asset pricing (Zhang, 2023); risk assessment in the real estate market (Brzezicka & Tomal, 2023; Tomal & Brzezicka, 2023).

## Data and Methods

To achieve the research goals, surveys were conducted. It was held in December 2022 and was attended by 100 people (57 women, 43 men). The respondents were students at the University of Warmia and Mazury in Olsztyn studying spatial management, geodesy and construction. The study group consisted of approximately 80% first-degree engineering students (3<sup>rd</sup> and fourth year of study), while the remaining 20% were students in supplementary master's studies (5<sup>th</sup> year of study). The distribution of the research sample is shown in Figure 1.

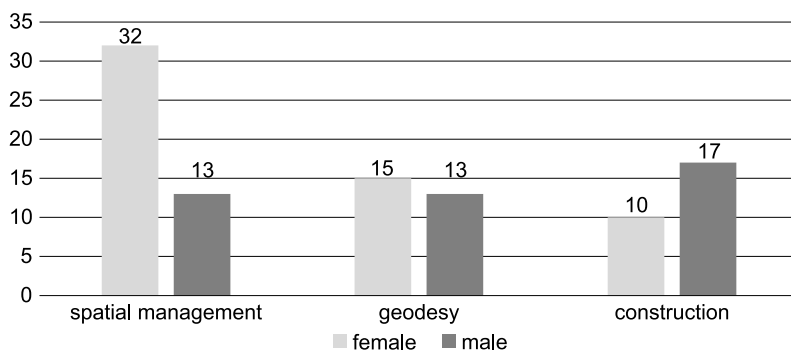


Fig. 1. Share of women and men of each field of study in the survey

Source: own study.

The questionnaire consisted of more than a dozen questions, some of which were used to achieve the research objectives presented above. It included metric questions, questions to determine actual attitudes toward risk, and questions on students' self-definition of their own attitudes toward risk.

In the part to determine actual attitudes toward risk, students were asked about their attitudes toward the amount of PLN 500 (Question 1), PLN 5,000 (Question 2) and PLN 500,000 (Question 3). However, Question 2 was chosen for further study due to the fact that it is a medium-sized amount (not too extreme to be too abstract and not too small to disregard the survey). The content of the question is shown in Figure 2. The questions include a risk variant due to the 50% probability of winning. This means that the expected value of this game is equal to PLN 2,500. On the other hand, the amount indicated as  $X$  is precisely the certainty equivalent of a lottery, since it is a guaranteed amount (100% probable). By comparing the expected value from the game and the value of the surety equivalent, it is possible to determine the respondent's attitude toward risk, according to the following interpretation (Tomal & Brzezicka, 2022, p. 2):

- if the amount  $X$  is equal to the expected value – risk neutrality;
- if the amount  $X$  is less than the expected value – risk aversion;
- if the amount of  $X$  is greater than the expected value – risk seeking.

**Question 2**  
 You have been invited to participate in a gain lottery with two possible outcomes:  
 option *A* – participating in the lottery and option *B* – receiving money.

A: 5000 PLN (50% chance) or 0 PLN (50% chance).  
 B: amount of money *X* (100% chance).

Indicate what amount of money *X* would have to be for you to be neutral about whether you participate in the lottery (variant *A*) or receive a payout (variant *B*).

*X* = .....

Fig. 2. Question about the actual attitude toward risk

Source: own study.

In the section to determine declared attitudes toward risk, the survey requested two questions presented in Figure 3. The first asked respondents to identify whether they were risk averse, risk seeker, or risk neutral. The second question was more specific, asking students to indicate on a 7-point Likert scale their attitude.

**Question 17**  
 Do you consider yourself to be:  
 a) risk-averse?  
 b) risk-seeking?  
 c) neutral to risk.

**Question 18**  
 Indicate on a 7-grade scale your attitude towards risk where:  
 1 – risk aversion, 4 – risk neutrality, 7 – risk seeking

1 – high risk aversion	2 – medium risk aversion	3 – low risk aversion	4 – risk neutrality	5 – low risk seeking	6 – medium risk seeking	7 – high risk seeking
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Fig. 3. Question about the declared attitude toward risk

Source: own study.

By comparing the responses to the questions presented in Figure 1 and Figure 2, we were able to:

- determine the attitudes of students toward risk;
- identify the differences in the actual and stated attitudes;
- determine the scale of these differences.

For the analysis of actual attitudes, the answers provided in Question 2 of the survey were used. To analyze the differences between actual and declared attitudes, the answers given in Questions 2 and 17 were used. Furthermore, taking into account the answers given to question 18, it was possible to determine the scale of these differences. Question 18 makes it possible to classify students' declared responses into one of 7 ranges of attitudes toward risk, and therefore, the responses given in question 2 also required classification into one of the 7 ranges, this time prepared on actual data. The scale of students' answers regarding the level of the certainty equivalent could take values from a closed range of 0 to 5,000 PLN, with an expected value of 2,500 PLN. Using these criteria, the equivalent value was divided into seven possible ranges, each PLN 714, as shown in Table 1.

Table 1  
Ranges of the value of the certainty equivalent (amount X)

Ranges	Range CE	lower bounds	upper bounds	Range of values
I	R. 1	0	714	<0;714)
II	R. 2	714	1,428	<714;1,428)
III	R. 3	1,428	2,143	<1,428;2,143)
IV	R. 4	2,143	2,858	<2,143;2,858>
V	R. 5	2,858	3,572	(2,858;3,572>
VI	R. 6	3,572	4,286	(3,572;4,286>
VII	R. 7	4,286	5,000	(4,286;5,000>

Source: own study.

The research procedure was to check for each individual answer what relationship exists between actual and declared attitudes. For this purpose, the students' answers given in Question 2 were ordered from smallest to largest, and then it was determined in which range from Table 1 they were (actual attitude determination divided on a 7-degree scale). Then the actual answers were compared with the answers declared in Question 18 (the declared attitude term expressed on a 7-degree scale). In this way, two streams of scores recorded on a scale from 1 to 7 were obtained – actual and declared. The actual answers were placed in a table with the coding (Tab. 2) of the results by numbers and the declared answers by an asterisk '\*'.

For example, a respondent who indicated in Question 2 an amount  $X$  worth PLN 2,500, specified in Question 17 that he is risk neutral, and indicated 4 in Question 18, will present a declared attitude consistent with reality ( $C$  compatible). On the other hand, a respondent who indicated in Question 2 an amount  $X$  of PLN 500, specified in Question 17 that he was risk neutral,

and indicated 4 in Question 18, would present a declared attitude incompatible with reality (INC – incompatible). The scale of differences between actual and declared responses was calculated as the difference in the scores between these responses in absolute value. The interpretation of the results was adopted as follows:

- 0 – no differences in actual and declared attitudes;
- 1-2 points – small differences in actual and declared attitudes (mean that the actual and declared answers differ by 1 to 2 points);
- 3-4 points – large differences in actual and declared attitude attitudes (mean that the actual and declared answers differ by 3 to 4 points);
- 5-6 points. – very large differences in actual and declared attitudes attitudes (mean that the actual and declared answers differ by 5 to 6 points).

An example of coding responses in the summary table is presented in Table 2 based on 14 sample responses, 2 respondents from each actual attitude range.

Table 2

Coding of responses

ID	Q2	Rate (Q2)	Rate (Q2)	Opinion (Q17)	C vs. INC	Opinion (Q18)	R. 1	R. 2	R. 3	R. 4	R 5	R. 6	R. 7	Scale of these differences
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
11	100	1	A	A	C	3	100		*					2
19	400	1	A	N	INC	5	400				*			4
97	1,000	2	A	A	C	3		1,000	*					1
90	1,000	2	A	S	INC	5		1,000			*			3
16	2,000	3	A	A	INC	4			2,000	*				1
58	2,000	3	A	S	INC	5			2,000		*			2
94	2,500	4	N	S	INC	3			*	2,500				1
31	2,500	4	N	S	INC	5				2,500	*			1
93	3,000	5	S	S	INC	5					3,000 *			0
52	3,000	5	S	S	C	6					3,000	*		1
3	4,000	6	S	A	INC	2				*		4,000		4
18	4,000	6	S	A	C	2					*	4,000		4
92	4,800	7	S	S	C	4					*		4,800	3
32	5,000	7	S	S	INC	3			*				5,000	4

A – risk averse attitude, S – risk seeker attitude, N – risk neutral attitude

Source: own study.



## Results and Discussion

First, the students' responses regarding their actual attitude toward risk were analyzed. The answers given to Question 2, regarding the expected value from the lottery of 2,500 PLN, revealed that the surveyed group was 41% risk averse, 21% risk neutral and 38% risk seekers. These results were in line with expectations. The belief that students are risk-oriented is a common opinion, but scientific research indicates that students mostly take risky actions when it is a necessity and not a choice, one in 4 students take risks rarely, and only a few percent of respondents involve themselves more strongly in risky situations according to their personality characteristics (Saran, 2019, p. 110). The results obtained in terms of the distribution of individual attitudes in the research group are partially consistent with the literature. Tomal and Brzezicka (2023) analyzed attitudes towards risk on the gain lottery in questions about money and obtained the following results: 67% risk aversion attitude, 12% neutral attitude and 21% risk seeking attitude. The mentioned study was carried out in a group of people aged 25-40, while this study was carried out in a group of students. A comparison of the results obtained from both research groups indicates that older people are more risk averse, which may result from the fact that with age they develop knowledge and experience in this area. Furthermore, as the expected value of the lottery increases, the number of risk-averse attitudes increases, and at the same time, the number of respondents who take a risk-seeking attitude decreases (see Fig. 4). These results are also consistent with those reported in the literature. Prospect theory (Kahneman & Tversky, 1979) clearly indicates that decision-makers change their attitude toward risk depending on gains and losses and whether the situation involves a small or large amount. When the lottery gains, risk aversion is observed, and many studies in various fields confirm this observation (e.g., Barberis *et al.*, 2021; Pawlonka, 2021). However, when declaring their attitudes, the students indicated a risk-averse attitude in 45% of the cases, a neutral attitude in 37%, and risk seeking in 18%. Therefore,

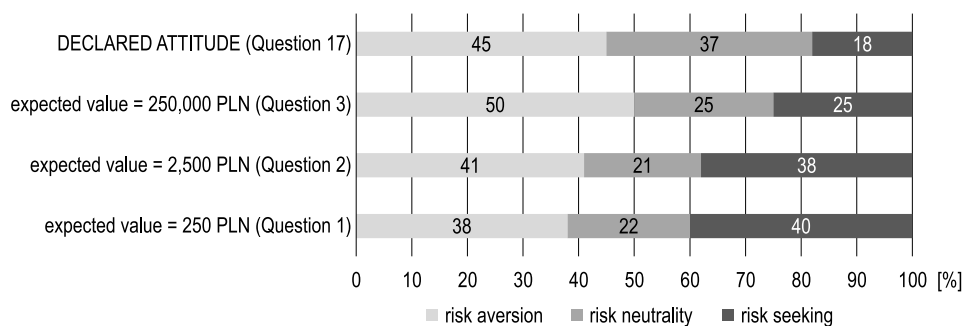


Fig. 4. Question about the declared attitude toward risk

Source: own study.

declared attitudes underestimate the number of risk-taker and overestimate the number of neutral attitudes.

Unfortunately, when students determine their own attitudes toward risk, only 35% determined them in accordance with actual attitudes, and up to 65% of respondents are characterized by the incompatibility of actual and declared attitudes. In the group of risk-averse respondents, only about 38% determine that they are risk-averse, in the group of risk-neutral respondents, only 30% of them indicated this attitude, and in the group of risk-takers, only 39% considered themselves risk-takers (see Tab. 3). This means that only one in three students correctly identified their attitude towards risk. According to the literature, risk-seeking varies into different spheres of life – taking high risks when doing extreme sports does not mean being willing to take risks when investing one’s own money (Tyszka & Zaleskiewicz, 2001). Risk taking preferences can also change as a result of experience obtained, as well as with increased competence acquired in the educational process (Adamczyk, 2018). So here we have an isolated research situation at a specific point in the life cycle – this may partially justify students who are unaware of their actual attitudes. Their knowledge of this is not yet established, and they are also still forming and acquiring their knowledge of themselves.

Table 3

Declared vs. actual attitudes of students toward risk (in percentage points)

Declared attitudes		Risk aversion	Risk neutrality	Risk seeking
Actual attitudes	risk aversion	17 (38% in grup)	14	10
	risk neutrality	9	11 (29 % in grup)	1
	risk seeking	19	12	7 (39% in grup)
Sum		45	37	18%

Source: own study.

The next stage of the study was to determine the scale of differences between declared and actual attitudes. These differences were calculated based on differences in the number of scores determined on a 7-degree scale. The results of this investigation were presented in a histogram (Fig. 5). The study shows that about 20% of the respondents do not show differences in actual and declared attitudes towards risk (0 points), almost half (49%) of the respondents show small differences (1-2 points), and the remaining 30% show large and very large differences (3-6 points). This means that despite the fact that students mostly misjudge their overall attitude toward risk, the assessment using a detailed difference scale shows that about half of the respondents make small errors in this assessment.

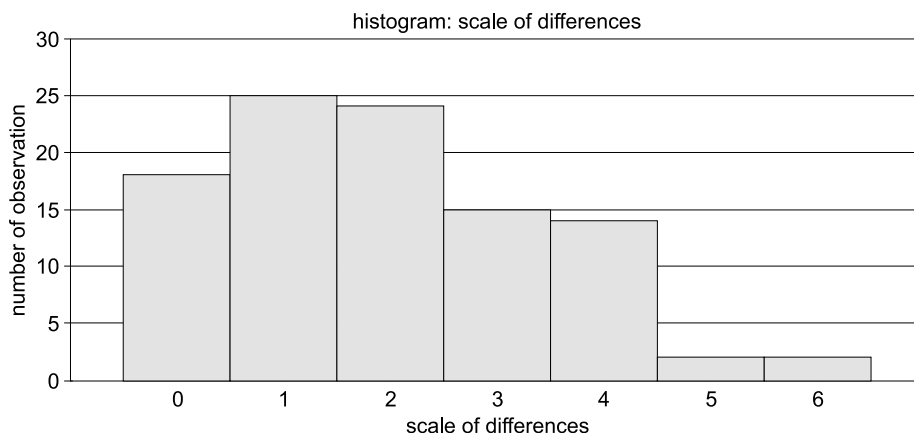


Fig. 5. Scale of differences in actual and declared attitudes

Source: own study.

In the next step, statistical tests of differences were also performed to see if there were statistically significant differences between actual and declared attitudes towards risk. First, a test was performed to see if the answers revealed in questions 2 and 17 were statistically different. The answers were recorded on a nominal scale (1 – risk averse attitude, 2 – neutral attitude, 3 – risk seeking attitude). A nonparametric chi-square test was used here, in which the distribution of the two answers was compared. Question 2 – that is, the actual responses – revealed that there are 41 risk averse, 21 neutral, and 38 risk takers in the population. This distribution was taken as the expected distribution and declared attitudes were checked to see if there was a concordance between the distribution and the expected distribution. A test value of  $\chi^2=23.107$ ,  $df=2$ ,  $p<0.001$  was obtained, which means that the differences between the actual and declared responses should be considered statistically significant.

In the next step, a test was performed to see if the answers revealed in Questions 2 and 18 were statistically different. Responses were recorded on an ordinal scale (from 1 to 7 respectively to the ranges of values shown in Table 1). Since the variables did not have a normal distribution, were described on an ordinal scale and the samples were dependent – a nonparametric Wilcoxon signed rank test was performed. The null hypothesis of this test is that the median difference between the variables is equal to zero. The p-value for this test was  $p=0.666$ , the test statistic  $T=1609$ , the standardized statistic  $Z=0.431$ , which means that the null hypothesis should be accepted – there are no differences between the medians of the two variables. Calculations of both tests were performed in SPSS software.

The results obtained confirm the above observations. When it comes to the overall assessment of their attitudes, the students mostly incorrectly assess their

attitudes toward risk (significant differences in population distributions according to the chi-square test). However, in the case of detailed analysis of attitudes toward risk, they make small errors, which is reflected in the results of the Wilcoxon test, which shows that the differences between declared and actual attitudes are not statistically significant.

## Conclusions

The article was dedicated to the issue of financial risks taken by students. Research distinguished students' attitudes toward risk according to prospect theory: risk aversion, risk seeking, and risk neutrality. The research confirmed observations in the literature that students are not risk-takers. In addition, observations from perspective theory were also confirmed: gain lotteries cause the risk aversion attitude. This attitude in the study group was prevalent and, in addition, the attitude towards risk changed depending on the size of the lottery amounts. The study also revealed that there is a large overall difference in actual and declared attitudes, but after examining these differences in detail and placing them on a scale, it turned out that about half of the students make a small error in assessing their attitudes.

The most important research limitation for the present study is the small sample size – only 100 survey responses collected, which may affect the applicability of the results presented. Therefore, further research directions should include conducting research on a larger study group. In addition, the discussion carried out with the results indicates that students' attitudes may differ among students studying in different fields of study and in different years of study, so such research should be carried out in the future to be able to determine with a greater degree of detail not only the scale of differences in declared and actual attitudes, but also the reasons for these differences.

Translated by the Author

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