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ORIGINAL RESEARCH PROJECTS
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Self-Esteem and Readiness to Solve Problems in University Students

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Abstract
The main aim of this study was to determine the relationship between self-esteem and the readiness to solve problems in university students. Factors differentiating the examined variables were also investigated. The diagnostic poll method was used. The necessary data was collected using the Rosenberg Self-Esteem Scale and the Problem-Solving Readiness Scale designed by K. Tomczak and A. Franczyk. The study participants were comprised of 263 students from two universities in Opole, Poland, aged between 18 and 35 years. The obtained results indicated a statistically significant, moderate positive correlation between self-esteem and the readiness to solve problems. Students attending courses in exact sciences also showed a higher level of self-esteem and readiness to solve problems than those attending courses in social sciences and humanities. Furthermore, students who were also employed had a significantly higher self-esteem than unemployed students. Gender was another significant differentiating factor: men showed a higher level of self-esteem and readiness to solve problems than women.

Keywords: self-esteem, readiness to solve problems, students, universities.

Introduction

In the era of constantly changing conditions for the functioning of societies, readiness to solve problems has become a particularly important concern. Such readiness may constitute a considerable asset in reaching one's educational, professional, and interpersonal goals. As a result, the manner in which an individual tackles an unfamiliar situation can become either future capital or a future burden, depending on a number of biological, psychological, family, economic, and environmental factors. At the same time, it can significantly affect the health of the individual experiencing such a situation, which can be explained through epigenesis (Lickliter, 2007). Over the last several years, university students have experienced numerous changes in the educational system. In the 2019/2020 academic year, all students were faced with the transition from stationary studying to remote studying. This transition caused anxiety in some students (Sokół-Szawłowska, 2020), while others developed entrepreneurial attitudes (seeking voluntary work and employment). Some students declared that they developed self-management and self-expression skills over the period of online education (Franczyk & Rajchel, 2021). In 2022, at a time when students were able to return to relative normality and resume stationary education, many individuals experienced a drop in their feeling of security with the outbreak of war in Ukraine. Due to the rising electricity prices, some academic centers decided to revert to remote learning. These ongoing changes required every institution and individual to show flexibility and a readiness to cope with problems.

Readiness to solve problems is associated with the potential to perform tasks optimally. As such, it constitutes a competence of the future (Funke et al., 2018). A university graduate, especially one with the ambition of becoming a manager, should demonstrate courage in taking risks and implementing new ideas, good anticipation and teamworking skills, creativity, flexibility, and an optimistic yet realistic attitude toward solving problems (Chhinzer & Russo, 2017; Winborg & Hägg, 2022). It is also important to have the relevant knowledge and the ability to apply it (Knosala et al., 2019), as well as to continuously

develop one's competences in order to not only manage the existing intellectual capital, but also to create new solutions (Tell & Hoveskog, 2022).

An observation of differences in the work performance among university students motivated the authors of this study to analyze the psychological characteristics of students, in order to determine the factors that affect the ability of an individual to cope with ongoing changes in the educational system. The aim of this study was to provide an insight into the relationship between self-esteem and readiness to solve problems in university students, and to determine the factors responsible for differences in the two variables.

Self-esteem of young adults

Self-esteem is one of the most frequently researched topics in the fields of personality psychology and social psychology. Research indicates that self-esteem is a predictor of an individual's academic performance and that it affects their self-confidence, work results, and satisfaction with their personal life (Cheema & Bhardwaj, 2021). However, the definitions of self-esteem vary across the subject literature. In simple terms, self-esteem is the personal, internal system of beliefs about oneself (Rahmani, 2011).

Szpitalak and Polczyk (2015) indicated that the term *self-esteem* is ambiguous, and carried out a review of its different definitions. Wiliam James (1892/2002) defines self-esteem based on what an individual has already achieved and what they think they can achieve. The level of self-esteem depends on the ratio of current achievements to aspirations. The lower the disproportion between these two variables (achievement/aspiration or the perfect I/the real I), the higher is the self-esteem and one's image of themselves (Szpitalak & Polczyk, 2015).

An alternative to this evaluative approach to self-esteem, which encompasses different areas of life (partial self-esteem) and can be used to assess them globally, is the affective approach, which focuses on an individual's feelings about themselves. Among the representatives of the latter approach is Rosenberg (2015), who associates self-esteem with an individual's attitude toward themselves. This attitude toward oneself can be either positive or

negative. In this respect, high self-esteem involves a feeling of high self-worth (Rosenberg, 1979). At the same time, high self-esteem does not necessarily translate into a feeling of superiority over other individuals. S. Coopersmith (1967) extended the attitude toward oneself with that of self-respect and belief in one's abilities. In other words, self-esteem is what we think about ourselves. According to Smith et al. (2014), self-esteem can be positive or negative. One's self-image is a component of self-esteem.

Self-esteem can be high or low. Individuals with high self-esteem are willing to perform multiple activities in the same day. They show enthusiasm and a positive attitude to their surroundings. They also make the effort to find solutions to their problems and welcome challenges (Strauss, 2005). Conversely, individuals with low self-esteem do not believe in their own abilities, feel envious, and are unwilling to accept change (Cheema & Bhardwaj, 2021).

Self-esteem, as a component of two cognitive systems – the rational (explicit) one and the empirical (implicit) one – is an important predictor of other behaviours (Szpitalak & Polczyk, 2015). The implicit system affects spontaneous and emotional actions, whereas the explicit system is a predictor of actions taken following a rational analysis. Importantly, self-esteem is a key to the behaviour that affects an individual's thought processes, emotions, desires, values, and goals (Branden, 1969). The epidemiological situation may have affected self-perception among academic youth, and consequently, their health.

Góra et al. (2020) conducted a study on the mental load in young adults (n = 271) and their adaptation to ongoing changes. Their results showed that the participants tended to exhibit emotional behaviours and a lowered constructive functioning (higher score on the obsessive thoughts subscale). Negative emotions and obsessive thoughts occurred alongside a lower effectiveness in goal-oriented behaviours. These results can be considered as typical for Generation Z, which has been observed to report more mental health problems than other generations (Bethune, 2019).

Readiness to solve problems

Many young people believe that an academic education guarantees finding a well-paying job in the field that they graduate in. However, discrepancies between the expectations of graduates and those of employers lead to a competence gap (Przytuła et al., 2020). Competences are the deciding factor in hiring employees (Wronowska, 2015). The labour market looks for employees with specific soft skills. Innovative companies expect candidates to have not only practical skills and experience, but also the potential for an optimal performance of tasks (Chavan & Cartel, 2018). This potential is related to the readiness to solve problems. Considering the growing uncertainty resulting from the pandemic, war, and energy crisis, readiness to solve problems may be regarded as a key mental predisposition in a university student and future employee. It is associated with a person's internal motivation, perseverance, flexibility, courage to introduce changes, and creativity. It is important that students entering the labour market be aware of their own problem-solving potential, as this may boost their self-confidence in handling various tasks, in both professional and private life (Flöthmann et al., 2018). Self-confident individuals recover their health quickly after failures and pursue their goals consistently (Goleman, 2012). A problem occurs when an individual pursues a goal, but does not know how to transform the initial state into the final state. In such a case, appropriate means must be developed to allow the transition to take place from the current state into the set goal (Nęcka, 1994, p. 28).

A report by the World Economic Forum (2016) lists adaptability among the future skills that employees should have, alongside creativity. Adaptability refers to an ability to adjust to changing environmental conditions, which in a business setting may help to improve an employee's ability to perform different roles and tasks (Kalleberg, 2001; Knosala et al., 2019). Another trait that contributes to problem solving is courage. Courage can be defined as making the effort to solve problems, usually despite hardships, and the willingness to take risks. Individuals with a creative approach to problem solving are ready to introduce changes and take risks to make it happen

(Dyer et al., 2011). Creativity, understood as the ability to create and the state of being inventive, also plays an important role (Sloane, 2005). However, the ability to develop valuable products is related not only to behaviour but first and foremost, to cognitive processes and personal traits; this is what makes creativity a complex phenomenon. Creativity is also sometimes defined as the potential to apply unusual solutions, which involves such personality traits as openness, sensitivity to problems, and motivation for action (Karwowski, 2009; Knosala et al., 2019, p. 12).

Another factor benefitting the readiness to solve problems is a growth mindset, which is the opposite of a fixed mindset. This division was proposed by Dweck (2021), according to whom the growth mindset is based on the belief that one's personality traits, skills, and intellectual potential can be developed through work. The determinants of the growth mindset are a fondness of challenges and perseverance, i.e., continuing to pursue goals despite being face with obstacles; while perseverance allows individuals to achieve greater successes than individuals with a fixed mindset. A study by Dweck (2021) showed that the attitude toward risk and effort results from a particular mindset. Beliefs are a strong contributor to the achievement of set goals and changing one's beliefs may make a significant difference. Research indicates (Oakley, 2018; Dweck, 2021) that growth-minded individuals who are better at assessing their strengths and weaknesses are better at turning their failures in life into successes, value persistence and patience in achieving goals more, and are able to adapt to change better than fixed-minded individuals.

Motivation is also an important factor in problem solving. According to various concepts and empirical evidence, employee motivation is a key factor in the success and development of companies (Hunter & Schmidt, 1996, pp. 447–472; Tomczak, 2022). Motivation can be thought of as a type of stimulus for action in employees. Griffin (2018) defined motivation as a system of forces that elicit specific behaviour in individuals. Karaś (2004) distinguished between external and internal motivation. External motivators contribute to a feeling of fairness among employees, who expect appropriate remuneration for their work; for example, in the form of a bonus. Conversely, internal motivation is driven by one's personal passion and interests. Accord-

ing to Hennessey and Amabile (2010), internal motivation makes introducing solutions a source of satisfaction, fulfillment, and awareness of one's own potential.

Research problems and hypotheses

The main research problem in this study is as follows: What is the relationship between self-esteem and readiness to solve problems in university students? Furthermore, a specific problem was formulated within that question: What factors differentiate between self-esteem and readiness to solve problems? The main hypothesis was formulated based on the following assumptions: The self-esteem of university students shows a positive correlation with their readiness to solve problems. The higher a person's self-esteem, the higher is their readiness to solve problems. However, no research hypothesis was formulated for the specific problem due to its exploratory nature (Rubacha, 2008, p. 102).

Research procedure and study participants

The study participants were comprised of 263 students from the University of Opole and the Opole University of Technology in Poland, with 65.4% women and 34.6% men. The highest share of participants were students aged 20 to 25 years (75.3%), followed by 18.6% aged up to 20 years, and 6.1% aged over 25 years. Almost half of the participants (49%) declared permanent residence in a city and the remaining 51% declared residence in a village. Most of the participants (87.1%) attended full-time courses and 12.9% attended part-time courses. Almost half of the participants attended courses in social sciences or humanities (48.3%), including teaching, philology, and economics. In turn, 51.7% of the participants attended courses in exact sciences, including logistics, management, and manufacturing engineering. A non-probabilistic sampling procedure was applied.

The diagnostic poll method was used. The students were asked to complete an online survey questionnaire, which was comprised of the Rosenberg

Self-Esteem Scale (SES), the previously unpublished Problem-Solving Readiness Scale (PSRS), designed by K. Tomczak and A. Franczyk, and a section containing questions about their age, gender, place of residence, attended course, mode of studies, and employment status.

A Polish adaptation of the SES was proposed by Dzwonkowska, Lachowicz-Tabaczek, and Łaguna (2008). The Rosenberg Scale is one of the most popular scales for the measurement of self-esteem. It has a univariant structure and is used to assess global self-esteem or, sometimes, persistent disposition, defined as a conscious attitude (positive or negative) toward the self. The respondents are asked to declare their attitudes toward 10 statements by marking their answers on a 4-point scale (ranging from "strongly agree" to "strongly disagree"). Scores from all the answers are then totalled. The total score ranges from 10 to 40 points. The higher the score, the higher is a given respondent's self-esteem. The reliability of the Polish version of the SES ranges from 0.81 to 0.83 (Cronbach's α) for $N = 1121$. The reliability of the original version ranges from 0.77 to 0.88 (Łaguna et al., 2007).

The Problem-Solving Readiness Scale (PSRS), developed by Tomczak and Franczyk, consists of six statements about traits needed to solve problems (Annex). The respondents are asked to declare their attitudes toward these statements based on a 4-point scale, with 1 denoting "strongly disagree", 2 indicating they "disagree", 3 indicating they "agree", and 4 indicating they "strongly agree". The total score is calculated by summing the scores from all answers (with the points being reversed for the sixth statement). The total PSRS score ranges from 6 to 24 points. The higher the score, the higher is a given respondent's readiness to solve problems. The reliability of the PSRS amounts to 0.71 (Cronbach's α).

The obtained results were analyzed using the *Statistica* 13.3 software package. Because the requirements for the use of a parametric test were not met, the non-parametric Mann-Whitney *U* test and Spearman's rank-order correlation was used. Differences between the groups were considered as statistically significant at $p < 0.05$.

Results

Table 1 presents the SES and PSRS scores obtained in the group of 263 university students.

Table 1. Descriptive statistics for the group of university students (n = 263) concerning self-esteem and readiness to solve problems

Variable	Min	Max	*M*	*SD*	*Me*
Self-esteem (SES)	16	39	27.57	4.17	28
Problem-Solving Readiness (PSRS)	9	24	17.22	2.60	17

Note: Min – minimum, Max – maximum, M – mean, SD – standard deviation, Me – median
Source: Authors' research.

The mean score from the full sample on the SES was 27.57 (SD = 4.17) and was slightly lower than the mean calculated for the Polish adaptation of the scale conducted, among others, in a group of 452 university students (M = 29.83; SD = 4.16) (Łaguna et al., 2007, p. 168). In turn, the mean score on the PSRS was 17.22 (SD = 2.60).

Correlations between variables were tested in order to determine the relationship between self-esteem and the readiness to solve problems in the participants. The normality of variable distribution was analyzed using the Kolmogorov–Smirnov test. The distribution of variables from the SES was similar to normal, whereas the distribution of variables for the PSRS differed from normal. Consequently, the analysis was based on the Spearman's rank-order correlation (Table 2).

Table 2. Spearman's rank-order correlation between self-esteem and readiness to solve problems

	Problem-solving readiness (PSRS)
Self-Esteem (SES)	0.52
Spearman's rank-order correlation	0.05
Significance n	263

Source: Authors' research.

The results indicate a significant moderate positive correlation between self-esteem and the readiness to solve problems (*rho* = 0.52, $p < 0.05$). This means that the readiness to solve problems increased with an increase in self-esteem.

The Mann–Whitney *U* test was performed in order to verify whether self-esteem and the readiness to solve problems in the university students differs depending on the type of course (social sciences and humanities vs. exact sciences) (Table 3).

Table 3. Results of the Mann–Whitney *U* test of differences in self-esteem and the readiness to solve problems between students of social sciences and humanities and students of exact sciences

Variable	Social sciences and humanities (*n* = 127)			Exact sciences (*n* = 136)			*Z*	*p*
	M	*Me*	*SD*	*M*	*Me*	*SD*		
SES	25.23	25	3.87	29.75	29	3.15	-9.675	0.001
PSRS	16.57	17	2.59	17.82	18	2.47	-4.205	0.001

Source: Authors' research.

The data analysis performed indicated that the type of course significantly differentiated the participants' self-esteem and readiness to solve problems ($p < 0.001$). Specifically, students of exact sciences showed higher self-esteem and readiness to solve problems than students of social sciences and humanities.

The study also tested whether gender differentiated the participants' self-esteem and their readiness to solve problems (Table 4).

Table 4. Results of the Mann–Whitney *U* test for differences in self-esteem and the readiness to solve problems between women and men

Variable	Women (*n* = 172)			Men (*n* = 91)			*Z*	*p*
	M	*Me*	*SD*	*M*	*Me*	*SD*		
SES	27.13	27	4.09	28.40	28	4.22	2.008	0.04
PSRS	16.91	17	2.66	17.80	18	2.38	2.404	0.02

Source: Authors' research.

The analysis performed indicated that men showed a significantly higher level of both self-esteem ($p < 0.04$) and readiness to solve problems than women ($p < 0.02$).

The Mann–Whitney *U* test was used to determine whether self-esteem and the readiness to solve problems differed depending on the participants' employment status (employed vs. unemployed) (Table 5).

Table 5. Results of the Mann–Whitney *U* test for differences in self-esteem and the readiness to solve problems between employed students and unemployed students

Variable	Employed students (n = 115)			Unemployed students (n = 148)			*Z*	*p*
	M	*Me*	*SD*	*M*	*Me*	*SD*		
SES	28.36	29	4.04	26.95	27	4.19	2.753	0.006
PSRS	17.30	24	2.67	17.16	24	2.55	0.659	0.510

Source: Authors' research.

The analysis of the obtained results indicated that employed students had a significantly higher self-esteem than unemployed students ($p < 0.006$). On the other hand, the employment status did not differentiate between the participants' readiness to solve problems ($p > 0.05$).

Discussion

The main hypothesis, i.e., that the participants' self-esteem correlates with their readiness to solve problems, was verified positively. An increase in self-esteem was observed to co-occur with an increase in the readiness to solve problems. This result corresponds to those obtained in previous studies on self-esteem and self-efficacy (Juczyński, 2001; Turska-Kawa, 2016). An increase in self-esteem is associated with a stronger belief in one's abilities. Individuals with high self-esteem perceive themselves as more capable of social functioning and performing tasks than those with low self-esteem, even if such a perception is not reflected in reality (Łaguna et al., 2007, pp. 166–167). For example, individuals with high self-esteem consider themselves more talented, intelli-

gent, and popular despite showing no objective differences from those with low self-esteem (Baumeister et al., 2003). Individuals with high self-esteem were also found to be more persistent than those with low self-esteem and to engage in more varied activities, including activities often considered to be risky (Baumeister et al., 1996). Experiencing positive emotions fosters persistence and activity, and individuals with high self-esteem experience these emotions more often than those with low self-esteem, who conversely, experience negative emotions more often. As a result, the latter group tends to avoid difficulties and takes on challenges less actively (Łaguna et al., 2007, p. 166). Consequently, high self-esteem may be accompanied by a high readiness to solve problems, due to a belief in one's competences and skills to find effective solutions in the given circumstances.

In the present study, an attempt was made to identify which factors differentiate between self-esteem and the readiness to solve problems. The following factors were considered: type of study program (exact sciences vs. social sciences and humanities), gender (female vs. male), and employment status (employed vs. unemployed). Based on the analysis of the obtained data, it was found that the students of exact sciences exhibit higher self-esteem and readiness to solve problems than the students of social sciences and humanities. This is likely because the students of exact sciences are aware that their courses will prepare them for well-paid professions. According to the Polish Graduate Tracking System (*Ogólnopolski System Monitorowania Ekonomicznych Losów Absolwentów*), graduates of engineering and technical courses earn the most among full-time students (2020). Courses in the exact sciences provide students with advanced engineering knowledge, which is a valuable asset in building one's career and economic status. The high self-esteem of future graduates may also be influenced by the belief that not everyone is able to complete a technical course, as they require mathematical skills, logical thinking, independence, and persistence, which are competences that inspire respect and admiration.

Students of the exact sciences also showed a higher readiness to solve problems. This is also influenced by the curriculum of their courses, which fosters interdisciplinary and transversal skills. These include creativity, inno-

vativeness, formulating and solving problems related to managing processes using IT-supported engineering methods and techniques, and managing human capital, including organizing and supervising work teams.

It was also established that men exhibit a higher self-esteem and readiness to solve problems than women. Łaguna et al. (2007), Bleidorn et al. (2016), and Shamsaei (2019) obtained similar results related to self-esteem. These researchers underlined the fact that the gender-based differences in self-esteem may be determined biologically or socioculturally. According to the biological perspective, these differences are universal and originate from evolutionary psychological predispositions (Wood & Eagly, 2002). Conversely, the sociocultural approach explains that these differences originate primarily through social influences, which may differ depending on a particular context and culture (Orth & Robins, 2014). Perhaps the fact that men assess themselves higher than women results from gender stereotypes, which promote self-confidence and domination as typically male traits. Men are frequently encouraged to assume leadership roles, seize control, and to solve problems in their professional lives, and are rewarded for it. An individual who assumes particular roles more often than others is more likely to attribute to themselves the traits related to a good performance of their typical duties. According to Eagly's theory of social roles (1987), traits that are stereotypically male or female do not result from inborn differences but rather from a different course of socialization, in which men and women are assigned to different social roles. These roles enforce specific behaviours, which in turn are used to identify different traits in women and men. Even though the level of acceptance seems to be relatively constant in individuals, it does fluctuate depending on how well the individual in question performs their tasks and social roles (Stojanowska, 2007).

The analysis of the results indicates that the respondents' self-esteem is significantly differentiated by their status in the labour market. Employed students have significantly higher self-esteem than those who are not employed. However, no significant differences were observed between the groups in terms of their readiness to solve problems. Piróg (2013) referred to the theory of competences and the theory of human capital to demonstrate that

having a diploma as well as professional experience was a significant asset in a graduate. Annual studies conducted by Marszałek (2012) and Ostoj (2016) among students enrolled in full-time courses have shown that the number of students who decide to work in addition to studying is increasing. The primary motivation behind this decision is gaining professional experience. An analysis of data from the Polish Graduate Tracking System conducted by Rocki (2021) confirmed that students who started working while studying, or even before their enrolment in a university, were able to adapt more quickly to employer expectations. Students who combine working and studying have an opportunity to prove themselves in various roles, gain valuable professional experience, and improve their qualifications, which may also be a source of high self-esteem. Self-esteem also benefits from the financial independence that young people gain by working.

It is intriguing why the employment status did not prove to be a significant factor in differentiating the readiness to solve problems. Perhaps some students are engaged in jobs that require routine procedures and adherence to supervisors. On the other hand, the lack of significant differences between the employed and unemployed students may be due to the fact that university studies help develop competencies in critical thinking and the ability to handle social and professional challenges. According to the Polish Qualifications Framework (*Polska Rama Kwalifikacji*), a student should be able to use their knowledge to formulate and solve problems.

Conclusions

The following conclusions were drawn from the study:

1. There is a positive correlation between self-esteem and the readiness to solve problems;
2. Self-esteem in university students differs depending on the type of course, gender, and employment status;
3. Readiness to solve problems differs depending on the type of course and gender;

4. Students of courses in exact sciences show a higher self-esteem and readiness to solve problems than students of courses in social sciences and humanities;
5. Men show a higher self-esteem and readiness to solve problems than women;
6. Employed students show a higher self-esteem than unemployed students.

The obtained results provide an insight into the relationship between self-esteem and the readiness to solve problems and the factors that differentiate these two variables. In future research projects, it would be worth testing for a correlation between the readiness to solve problems and self-efficacy, a growth mindset, and the hope of success. In terms of practical implications, it could be beneficial for higher education institutions to expand their program offerings by including courses that develop problem-solving skills, especially in social sciences and humanities programs. Such courses would provide students with the opportunity to enhance the competencies that facilitate their adaptation to the dynamically changing conditions of the labour market.

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Appendix

Statements in the Problem-Solving Readiness Scale (PSRS) by K. Tomczak and A. Franczyk

No.	Statement	1	2	3	4
1	I'm able to adapt quickly to new circumstances.	1	2	3	4
2	I'm capable of taking risks.	1	2	3	4
3	I think I'm creative.	1	2	3	4
4	I can motivate myself to perform various actions.	1	2	3	4
5	I like solving problems.	1	2	3	4
6	I give up quickly when I can't resolve a task.	1	2	3	4

Legend:
1 – Strongly disagree
2 – Disagree
3 – Agree
4 – Strongly agree

Source: Own elaboration by K. Tomczak and A. Franczyk.