

Social skills and understanding emotions by students at technical and non-technical universities

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ABSTRACT: Emotional intelligence and social skills are necessary components of hands-on learning in engineering and technical education. The aim of the research presented here was to determine the ability of students to understand and analyse emotions and to use emotional knowledge. The research subjects were students from Cracow University of Technology (CUT) and the Andrzej Frycz Modrzewski Krakow University. In this article is presented the theoretical basis of the components of emotional intelligence and social competencies in five specific areas: assertiveness, co-operation, social mindedness, resourcefulness, and community awareness. This enables a profile to be created for a subject. Findings enable the level of social skills and their relationship to the understanding of emotions to be determined. This leads to examining whether there are clear differences between students, due to their differing profiles.

INTRODUCTION

The ability to feel, name and manage emotions is one of the most important skills that are necessary in dealing with different life situations and in social relations. Norman and Combs opine that emotions became more complex, while environment grows [1]. Further, they argue that our cognitive development is affected by emotions and it reflects in a quality of social and professional live. Nowadays, processing of emotions in or between people affects how one can cope with difficult situations. Thus, emotions as social valued skill provides information about individual's needs and goals [1]. As part of the development of competences in this area, emotional development training is used to foster knowledge of, and practical forms for, expressing and managing emotions.

Engineering and technology instruction involves teaching the student both cognitively and affectively [1]. Avsec and Kocijancic state that when technology and engineering is taught inclusively, it addresses not only subject content, but also the understanding of self and others [2]. Emotion affects attention, facilitates encoding and information retrieval, thus it can enhance learning as argued by Šinigoj and Avsec [3]. LeDoux posits that a full recognition of our emotions, their role, and their relationship to other mental functions is an important aspect of the more inclusive science of the mind that researchers now believe is evolving [4]. It was also found that social skills and emotional intelligence affect learning, both in the cognitive and meta-cognitive area, and are significantly related to one's self-efficacy [5-7].

THE CONCEPT OF EMOTIONAL INTELLIGENCE AND SOCIAL SKILLS IN THE SOCIAL SCIENCES

Emotional intelligence has assumed great importance over the past two decades, in educational, psychological and social studies, as well as research. Interest started in 1990 with the publication of John. D. Mayer and Peter Salovey's book, *Imagination, Cognition, and Personality*, as well as the publication in 1995 of Daniel Goleman's book, *Emotional Intelligence* [8]. These have contributed to the elaboration and spread of these concepts.

Emotional intelligence (EI) is the capacity to reason about emotions, and for emotions to enhance thinking [7][9][10]. An individual who has high EI has better social relations, can solve emotional problems quicker and easier than others, is strong in verbal, social and other intelligences, is less apt to engage in problematic behaviours, and avoids self-destructive and negative behaviours, such as smoking, drug abuse and violence [7][9][10]. Emotional intelligence has to do with discerning and understanding emotional information that is commonly used in daily life.

The concept of social competences means increased human skills in communication, co-operation, assertiveness, exerting influence on others, as well as the ability to resist influences. Researchers distinguish two functions of social competence: establishing and maintaining satisfying interpersonal relationships that quench the needs for approval and belonging, and achieving goals by exerting influence on others [11]. High social competences alongside emotional

intelligence and creativity are among the most desirable features that are valued by employers seeking candidates for positions at various professional levels [12].

Social competences are skills acquired during a person's life. They are formed gradually by contact and relationships with other people, and in the process of achieving different goals. Social relations, getting involved in helping others, public performances, and performing various functions are some of the activities that help us train our social skills. This can be referred to as natural training [11]. Of course, apart from social situations, the development of these competences is also influenced by the personality and temperamental features of a human being.

It is important to emphasise the motivational features of the individual. This can lead to the development of social competences consequent upon difficult social situations. Social competence deficits often spontaneously block people from seeking solutions that would make it easier for them to function and improve their quality of life. Training, soft skills development and workshops make it easier to overcome difficulties in social relations and are a valuable element of the study programmes at universities [11][12].

RESEARCH OBJECTIVES

The first goal of this research was to determine the level of understanding of emotions and the level of knowledge in the field of social competences among technical and non-technical university students. The second aim of the research was to capture whether there are significant differences related to the type of university or field of study.

STUDY GROUP

Participating students were from the Faculty of Psychology and Humanities at the Andrzej Frycz Modrzewski Kraków University (Number = 18); the Faculty of Mechanical Engineering (N = 45); and the Faculty of Chemical Engineering and Technology (N = 27) at Cracow University of Technology (CUT). In total, there were 90 students from two different types of university (technical and general). Gender distribution was almost equal, with 46 male and 44 female students. Findings will enable a determination of the level of social skills and the understanding of emotions, as well as any differences between different types of student (technical or general).

METHOD AND PROCEDURE

An emotional understanding test and social competencies test were used as described below.

The Emotion Understanding Test (TRE)

The TRE is an emotion understanding test by Anna Matczak and Joanna Piekarska [11]. The test measures understanding of emotions - one of the basic components of emotional intelligence. The emotional knowledge is treated as an ability indicator. The test consists of 30 tasks divided into five sub-tests, each containing six defined verbal tasks. The result is calculated as a whole score, based on the number of correctly solved tasks. The sub-tests are:

1. TRE1: consists of sorting out words describing emotional states of the same type (*anger, fury, rage, irritability*) in the order from weakest to strongest emotion.
2. TRE2: consists in finding a word that means the opposite emotion to the one stated (*e.g. the opposite to hope is boredom, resignation, acceptance, sadness*).
3. TRE3: consists in indicating names of simple emotions that are components of more complex emotions (*e.g. jealousy contains resentment, desire, aversion, anger*).
4. TRE4: tasks are based on matching the names of feelings that most likely can appear in example situations (*e.g. surprise will cause gratitude, joy, surprise, distrust*).
5. TRE5: This task describes a situation and an emotional reaction to it; the subject has to find a condition leading to a way of reacting (*e.g. find a condition that makes a person react with amusement to publicly uttered jokes*).

The performance of each task is scored on a zero to one scale, the maximum possible result being 30 points. The TRE test can be used in research and for individual assessment as well, and is recommended for EI research.

The social competencies profile (PROKOS)

The PROKOS is a social competencies profile test by Anna Matczak and Katarzyna Martowska [13]. It measures social competencies in five specific areas to create a competencies profile. The areas are:

1. assertiveness;
2. co-operation;
3. social mindedness;
4. resourcefulness;
5. community awareness.

The PROKOS consists of 60 diagnostic items (concerning social competences) and 30 buffer items (concerning non-social competences). All items describe activities or tasks. The item form is modelled after the KKS questionnaire of Anna Matczak, but their content is changed to include situations and activities typical of the social functioning of an adult, especially at work. The examinee rated how he/she copes or would cope with listed activities or tasks on a four-point scale - from decidedly well to rather well to rather poorly to decidedly poorly. The diagnostic items constitute five scales, developed on the basis of a factor analysis.

RESULTS

Below are presented the average scores and an analysis of variance for the TRE and PROKOS tests for students from the technical university (Faculty of Mechanical Engineering, Faculty of Chemical Engineering and Technology, and the non-technical university (Faculty of Psychology and Humanities).

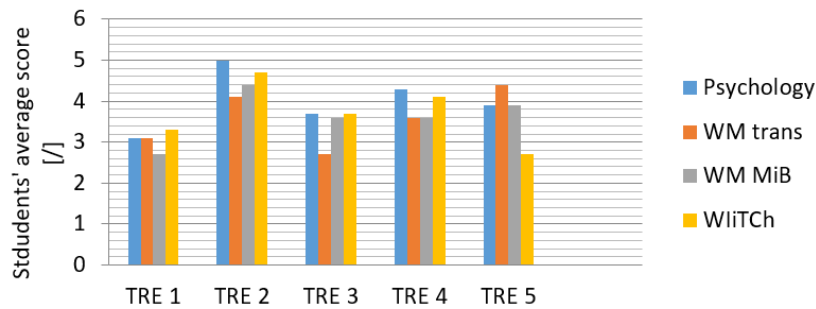


Figure 1: Average scores for the TRE1-4 tests (N = 90).

Figure 1 shows the mean results for the TRE tests and indicate that the highest average results in the TRE test, parts 2, 3 and 4 were obtained by psychology and humanities students. In TRE 5 the highest results were obtained by students from the mechanical engineering faculty (transport department).

Table 1 shows the results of an analysis of the variance between technical and non-technical students.

Table 1: Variance analysis between technical and non-technical students on the TRE test ($p < 0.05$).

TRE test	F	<i>p</i>	Eta squared
TRE 2	4.353	0.040	0.047
TRE total	6.571	0.012	0.069

Significant statistical differences were observed only for test TRE 2 and in the total score between psychology students and other students (see Table 2). Students of psychology more often indicated the correct opposites in the names of emotions (TRE2). The eta squared value for effect size is moderate.

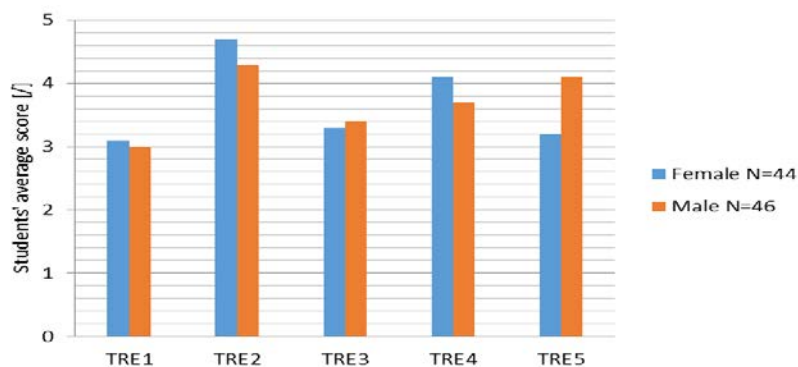


Figure 2: Descriptive statistics for TRE by gender (N = 90).

Figure 2 shows that females scored best on TRE 1, 2, 4 and males for TRE 3, 5.

Table 2: Variance analysis between female and male students on the TRE test ($p < 0.05$).

TRE test	F	<i>p</i>	Partial eta squared
TRE 5	12.970	0.001	0.128

Significant statistical differences were observed between woman and men students on TRE 5 (Table 2). The male students achieved higher results than females in the task that describes a situation and an emotional reaction to it, where the subject has to find a circumstance conditioning the emergence of such a way of reacting (see example above).

Figure 3 shows the variance between technical and non-technical students on the PROKOS test ($p < 0.05$).

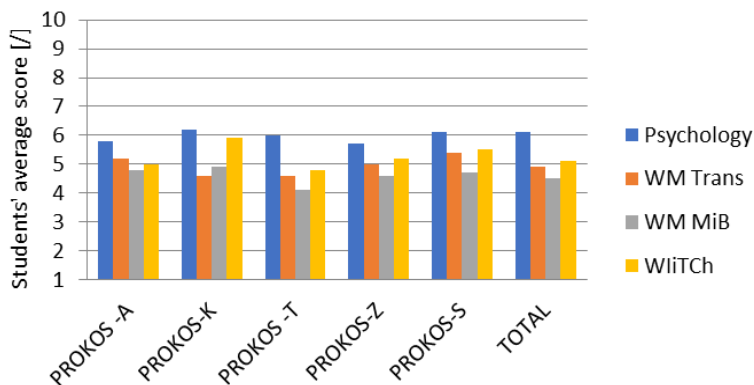


Figure 3: PROKOS test results (N = 90).

Statistically significant differences were found for PROKOS-K, PROKOS-T, PROKOS-S and PROKOS (total) (see Table 3). The effect size eta squared was estimated as moderate (0.05, 0.11, 0.04 and 0.86, respectively).

Table 3: Variance analysis between technical and non-technical students on the PROKOS test ($p < 0.05$).

PROKOS	F	<i>p</i>	Partial eta squared
PROKOS-K co-operation	4.278	0.042	0.055
PROKOS-T social mindedness	8.964	0.004	0.108
PROKOS-S community awareness	3.242	0.049	0.042
PROKOS total score	6.956	0.010	0.086

Significant statistical differences were observed in the PROKOS test for social competencies in three areas, viz. co-operation, social mindedness, and community awareness, as well as in the total score between psychology students and students from other disciplines, i.e. students of psychology more often produced the correct answers.

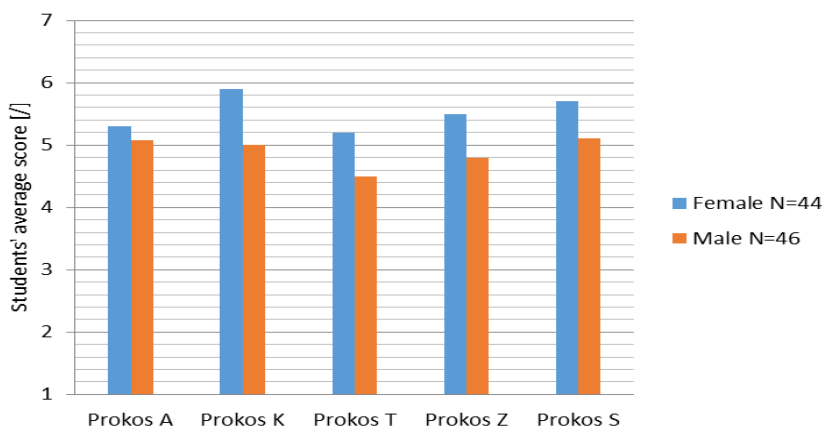


Figure 4: Descriptive statistics for PROKOS by gender (N = 90).

Figure 4 shows mean results for PROKOS and these indicate that the most correct answers in the PROKOS test were obtained by the women and not the men. Only for the PROKOS-K subscale was there a significant difference ($p = 0.036$) between male and female students, in favour of female with an effect size of eta squared = 0.058 (moderate effect). For the other subscales, gender did not influence social skills. This confirmed finding of Šinigoj and Avsec who argued that gender does not influence self-efficacy, social skills and emotional intelligence [14]. Moreover, students' self-efficacy affects academic results, which may be related to their social skills and affective competencies [8].

DISCUSSION AND CONCLUSIONS

When analysing the results, it should be noted that both in the TRE test, which examines the level of understanding of emotions, and the PROKOS test, which profiles social competences, higher scores were obtained by psychology students. This seems obvious due to the studies that psychology students chose, which is related to work and relating to others, and this requires skills in both of these areas. The results also indicate that in both of the analysed areas of human activity, that is knowledge of emotions and social competences, there is a deficit of knowledge among students of technical universities and, in particular at Cracow University of Technology. This result may be related to the stereotypical understanding of the specifics of technical studies, which mainly focuses on specialist knowledge in the selected majors.

Social skills are recognised as knowledge that a technical university student should have, but it is not a priority objective. This knowledge should be gained by other less formal (social) ways, and the emphasis on expanding it in the course of study is typically seen as pointless. Low scores in both the emotion understanding test and the social competency test can provide important feedback for people planning university and technical study programmes as part of changing the perception about this issue.

The results indicate a better understanding of emotions by women, which can be explained by the process of socialisation, which is different for girls and boys [7]. Boys are taught not to show emotions and to be efficient in the implementation of tasks. Excessive emotionality in men is not socially acceptable. Of course, this is also conditioned by culture. In this context, the results in the TRE5 test, in which men obtained higher results than women, seem to be interesting. Tasks in this part required the respondents to find the circumstances conditioning the emergence of the chosen response. Perhaps this way of presenting the situation causes men to be more task-oriented, and this makes them want to solve the problem, which they are better at.

In summary, it should be taken into account that the group of psychology students was not as numerous as the technical students and therefore the conclusions cannot be generalised. However, the important issue is that both TRE and PROKOS are diagnostic tools that can be used in the recruitment process. Also, because knowledge of the range of emotions, as well as social competence, are highly valued by employers and indispensable in professional relationships, it is worth breaking the stereotypical thinking that among engineers only hard skills are highly valued, that is specialist knowledge.

More studies and research are needed to describe variables of emotional intelligence and social skills, according to gender and from other perspectives. One proposal is to investigate the association between gender identity and self-efficacy and social skills, as well as emotional intelligence, to better understand how these affect engineering studies.

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