

# Learning in a Database Course: The Same Regardless of Gender?

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**Abstract:** Despite male and female students' equal performance in computer science courses that are gender-balanced in their design, gender differences can still appear in satisfaction, engagement and in academic help-seeking. Therefore, this paper aims to detect gender differences in behavioural engagement, academic help-seeking, satisfaction and attitudes in an introductory database course. The course is one of the introductory courses at the Institute of Computer Science of the University of Tartu, providing an overview of the theory of relational databases and SQL query language. A total of 239 students of 336 who participated in this course in 2024 filled in the questionnaire. The questionnaire consisted of three main parts: satisfaction and attitudes, behavioural engagement with the course, and getting academic help. Among these respondents, 104 were female, 131 were male, and four students did not want to specify their gender. The Mann-Whitney U-test and the chi-square test were used with SPSS. The results indicate no statistically significant gender differences in satisfaction with the course and the attitudes toward databases. However, differences were observed in behavioural engagement with the course and in the use of academic help. As the differences emerged in these two areas, the results of the study might be helpful for course designers to provide different tools, which correspond to both male and female students' needs.

**Keywords:** Gender Differences, Satisfaction, Engagement, Academic Help-Seeking

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## 1. Introduction

The underrepresentation of females in Computer Science (SC) courses and the lower motivation and interest in computer science are widely reported (Du & Wimmer, 2019; Viera & Couto, 2020). However, there are some studies (e.g. Ilias & Kordaki, 2006; Zahedi et al., 2021) whose results indicate that there are no differences in performance between male and female students in CS, including database courses (e.g. Berdousis & Kordaki, 2019; Luik, 2024). Since learning success is closely connected to course satisfaction (Thien & Jamil, 2020), which in turn influences engagement (Bayrak et al., 2020), and research (Kessels & Steinmayr, 2013; Wirtz et al., 2018) has shown that academic success is also related to help-seeking, it would be important to find out whether courses with no gender differences in learning outcomes exhibit gender differences in satisfaction, behavioural engagement and help-seeking.

### 1.1 Satisfaction

For overall satisfaction, the results are not conclusive. In an earlier study, female students reported higher global satisfaction (González-Gómez et al., 2012), but no gender differences have been found in more recent studies (Bayrak et al., 2020). However, there are several aspects that can affect overall satisfaction with the course and these aspects might be different for females and males. For example, it has been found that good teaching, including constructive feedback, is the strongest predictor of overall satisfaction for female students, but there was no significant effect of good teaching on male students' overall satisfaction (Thien & Jamil, 2020). Females' satisfaction was influenced by solving practical cases but, contrary to female students, male students were influenced more by presentation and organisation of the content (González-Gómez et al., 2012).

Typically, a course consists of different learning activities, which are assessed, and some of these activities might be more suitable for females and some for males, ensuring that the course as a whole is gender balanced (Luik, 2024). Therefore, it is important to study satisfaction with the different course aspects and tools. Comparisons of different course aspects have indicated that women are more appreciative of the content of the course, self-evaluation possibilities, teaching guides with precise schedule, contact sessions (González-Gómez et al., 2012), attractiveness of the material, help options (Genç & Tinmaz, 2016) and logical structure (Genç & Tinmaz, 2016; González-Gómez et al., 2012). There were no gender differences in satisfaction with the pace of the course (González-Gómez et al., 2012).

### 1.2 Behavioural Engagement

Satisfaction with the course elements influences engagement. In courses, learners engage with different learning tools, materials, and activities provided by course instructors. Engagement is a multidimensional construct that includes behavioural, emotional, cognitive, and social engagement (e.g. Deng et al., 2020; Fredricks et al., 2004). However, based on the meta-analysis conducted by Bond (2020), most studies define

engagement from a behavioural perspective. One reason might be that behavioural engagement is considered to be most important for academic success (Fredricks et al., 2004).

In a gender comparison, research shows that females report higher engagement than males, especially in behavioural engagement (e.g. Bru et al., 2021; Lietaert et al., 2015). Female students read more learning materials (YeckehZaare & Resnick, 2019), participate more in practicals (Luik, 2024) and distribute their studying over more days (YeckehZaare et al., 2022). In addition, female students attend more course activities (Nja et al., 2019; Wang et al., 2023). One of the explanations for this gender difference might be the course activities might be more suitable for females (Geist & King, 2008). The other might be that, especially in computer science, females feel they have fewer skills and compensate by studying more (YeckehZaare et al., 2022) or they might not believe they can complete their homework tasks without attending practicals (Luik, 2024).

### 1.3 Academic Help-Seeking

Besides engagement, academic help-seeking is related to academic success (Kessels & Steinmayr, 2013; Wirtz et al., 2018). Help-seeking can be categorised as adaptive (asking for clues or explanations), expedient (obtaining answers without concern for understanding), or avoidance of help altogether (Oh et al., 2024). While academic help-seeking can often be understood as asking teachers or peers for help, it can also entail the use of any other resource, including non-human resources like online course tools and the Internet (Hao et al., 2016; Wirtz et al., 2018). Artificial intelligence (AI), including ChatGPT, is also a possibility when it comes to asking for academic help (Adams et al., 2024). Efforts to provide students with adaptive help include development of different tools, such as troubleshooters that guide students to the answer with the help of cues and examples (Lepp et al., 2018). Such online tools are good, because students are often afraid to look incompetent in front of others (Yang & Taylor, 2013).

Studies about gender differences in academic help-seeking show contradictory results. Kessels and Steinmayr (2013) report that male students seek academic help less than females, but other studies (e.g. Hao et al., 2016; Oh et al., 2024) have revealed no direct influence of gender on asking for help. Help-seeking might be related to self-efficacy, which might be why female students report more help-seeking (Yang & Taylor, 2013). Self-efficacy might be an important factor in seeking academic help in CS, as studies (e.g. Berdousis & Kordaki, 2019; Kori & Luik, 2020; Viera & Couto, 2020) indicate that self-efficacy of female students is lower than that of males. In CS courses, females often lack a sense of belonging (Berdousis & Kordaki, 2019), and their asking an instructor for help depends on perceived supportiveness of the instructor (Oh et al., 2024).

### 1.4 Purpose of the Study

As no statistically significant differences in achievement were observed (Author, 2024), this study provides a unique opportunity to investigate whether behavioural engagement, academic help-seeking, and satisfaction with the course are different or the same between males and females, or whether their pathways to equal performance are different and they find satisfaction in different tools. Therefore, this study aims to detect gender differences in behavioural engagement, academic help-seeking, satisfaction and attitudes in an introductory database course. According to the aim, three research questions were posed:

1. What are the gender differences in satisfaction with the course and attitudes toward databases?
2. What are the differences in behavioural engagement between male and female students?
3. What are the differences between male and female students' academic help-seeking resources and attitudes toward using troubleshooters?

## 2. Method

### 2.1 Context of the Study

The Database course in the University of Tartu is one of the introductory computer science courses, mainly designed for first-year bachelor's students majoring in computer science or mathematics and statistics. However, this course is also compulsory in several other curricula (data science, software engineering, environmental science, etc). Over 300 students take this course each year, and the completion rate is approximately 85%. The course lasted 16 weeks and was worth 6 ECTS credits (1 ECTS equals 26 hours of work), which includes 5-8 hours of independent work per week. In the course, relational database theory and the Structure Query Language (SQL) are primarily introduced. Different activities are needed to complete the course:

three quizzes based on video lectures, active participation in practicals, SQL tasks and completion of a team project (Author, 2024). The course ends with an exam, which consists of two parts: an SQL code exam and a database theory exam. The tools and materials used in this course are video lectures equipped with self-assessment tests, reading materials with self-assessment tests supporting practicals, troubleshooters for giving hints and examples of certain aspects of solving the SQL tasks, and automated assessment system for submitting SQL tasks. All the systems were integrated with the Moodle Learning Management System (LMS). Weekly letters were sent to the participants each Monday morning, informing them of what was coming this week and giving some statistics for the previous week. The course was designed to be gender-balanced, as is also evident from the fact that no statistically significant differences were found in the theory quizzes, SQL tasks, teamwork, first part of the exam, the second part of the exam or the final grade in 2023 (Luik, 2024) and in 2024 (no difference in all mentioned activities with Mann-Whitney U-test  $p > .05$ ).

## 2.2 Sample

336 students (28.0% of them females) studied in this course in spring 2024. At the end of the course, on the 14th week, a link to the questionnaire with the information sheet was sent to the students. The students were informed that feedback on the course would be collected, and the responses would be anonymous and used only in a generalised form. Completing the questionnaire was unrelated to course grade or completion, and participants had the right to request the deletion of their data. The research was coordinated with the Research Ethics Committee of the University of Tartu (Approval 385/T-22). 239 students (71.1% of the students in the course) filled in the questionnaire. Among the respondents, 104 (43.5%) were female, 131 (54.8%) were male, and four students did not want to specify their gender. As this paper is aimed at detecting gender differences, these four students were omitted from the subsequent data analysis.

## 2.3 Data Collection and Analysis

The questionnaire consisted of three main parts. The first part measured satisfaction with the course based on 12 items with a 5-point Likert scale (1 - strongly unsatisfied, ... 5 - strongly satisfied), and Cronbach's alpha of this part was .793. In addition, the students were asked to rate on a 5-point Likert scale (1 - strongly disagree ... 5 - strongly agree) five statements measuring attitudes toward databases, and Cronbach's alpha of this part was 0.755.

Behavioural engagement was measured using data from Moodle, which was anonymised after labelling it with the participant's gender. This data was used for all participants in the course. The indicators used to measure behavioural engagement included the number of students who participated in practicals, submitted quizzes, submitted SQL tasks, and submitted the team project. As the use of certain materials and activities in the course (e.g. self-assessment test, troubleshooters) could not be recorded in this manner, five additional items with a 5-point Likert scale (1 - I never used it ... 5 - I used it in all weeks) were included in the second part of the questionnaire to measure behavioural engagement. As the reliability statistic, Cronbach's alpha calculated for this part of the questionnaire was 0.767. In addition, the respondents were asked to report the approximate number of hours they spent on independent learning in this course during the week.

The third part of the questionnaire measured academic help-seeking. The students were asked an open-ended question about which resources they received academic help from. In addition, there was a yes/no question: did they use artificial intelligence (AI) during the course for learning? More specifically, help from troubleshooters as an option of academic help-seeking (Lepp et al., 2018) was measured, as this tool was offered by the course instructors among the possibilities to get online help. The part of the questionnaire about getting support from troubleshooters started with a question on whether the learner used troubleshooters or not, and when. If they had used it, attitudes toward using them were measured on a 5-point Likert scale (1 - strongly disagree ... 5 - strongly agree). This part comprised 12 statements, and Cronbach's alpha was 0.878.

Gender was the only item of background data that the respondents were asked to report. To increase validity, the questionnaire was piloted in 2023 with the participants in this course. Last year, 81 students filled out this questionnaire, added comments and marked ambiguous wordings in the questionnaire.

The data was analysed using the program IBM SPSS Statistics 29.0.2.0. As the variables were on a Likert scale, a non-parametric Mann-Whitney U-test was used to compare ratings of males and females, and the chi-square test was used to compare the distribution between male and female students. The Fisher Exact test or the Fisher-Freeman-Halton Exact Test was used if one of the cells in the table had less than five observations.

### 3. Results

#### 3.1 Gender Differences in Satisfaction and Attitudes

This part focus on the first research question, which was about the gender differences in satisfaction with the course and attitudes toward databases. Comparing students' satisfaction with the course and its materials, there were mostly no statistically significant gender differences (see Table 1). Male students rated higher feedback, which they received from automated assessment systems on SQL tasks, than females.

**Table 1: Comparison of male and female students' ratings on the course and its materials**

	Males M (SD)	Females M (SD)	U	p
Pace of the course	4.4 (0.86)	4.2 (0.92)	6084.0	0.148
Content of the course	4.3 (0.75)	4.4 (0.76)	6739.0	0.877
Moodle LMS	4.3 (0.97)	4.2 (0.82)	6409.0	0.396
Interestingness of the course	4.2 (0.75)	4.3 (0.70)	6133.5	0.153
Usefulness of the course	4.4 (0.67)	4.6 (0.64)	5980.0	0.069
Feasibility of the course	4.2 (0.91)	4.3 (0.82)	6524.0	0.549
Video lectures	3.8 (1.12)	4.1 (0.84)	5519.0	0.119
Reading materials	4.2 (0.77)	4.3 (0.84)	6255.0	0.555
Practicals	4.2 (0.95)	4.1 (0.91)	6610.5	0.756
Feedback from automated assessments to SQL tasks	4.3 (0.68)	3.8 (1.05)	4025.0	<b>&lt;0.001</b>
Weekly letters	4.4 (0.83)	4.5 (0.80)	5942.0	0.495
Team project	3.9 (1.00)	3.8 (0.92)	6339.0	0.404

On the one hand, this finding supports the conclusion by Bayrak et al. (2020) that among the new generation there are no gender differences in satisfaction with a course. On the other hand, the ratings did not indicate that the course might be more feasible, useful or interesting for males as has been reported previously regarding the computer science courses (Du & Wimmer, 2019; Viera & Couto, 2020). In addition, whereas González-Gómez et al. (2012) reported that females rate higher contact sessions, no gender differences were found in the ratings on practicals as the only contact sessions in our study. The only statistically significant difference observed was in satisfaction with the feedback from automated assessments on SQL tasks, where males reported higher satisfaction than females. Thien and Jamil (2020) suggest that constructive feedback from teachers is a strong predictor of overall satisfaction, particularly for female students. This finding indicates a need for further investigation. Although the SQL automated assessment environment provides immediate corrective feedback, it is possible that the human factor in feedback is more crucial for females than the feedback content alone.

There were no statistically significant differences in attitudes toward databases (Table 2). Both males and females reported equal interest in databases, their ability, suitability for working with databases, and intention to work with databases in the future.

**Table 2: Comparison of male and female students' attitudes towards databases**

After the course...	Males M (SD)	Females M (SD)	U	P
... I am more interested in databases.	3.7 (0.95)	3.8 (0.96)	5868.5	0.486
... I feel that I am good with databases.	3.8 (0.85)	3.8 (0.83)	6160.0	0.950
... I feel that working with databases suits me.	3.3 (0.98)	3.4 (1.05)	5790.0	0.388

After the course...	Males M (SD)	Females M (SD)	U	P
... I know what it means to work with databases.	4.1 (0.92)	4.0 (0.97)	5854.0	0.462
... I would choose to work with databases in the future.	2.7 (0.99)	2.7 (1.14)	5962.0	0.625

This result is also in contradiction with previous studies (Du & Wimmer, 2019; Viera & Couto, 2020). While negative stereotypes and lack of role models are considered among the reasons why women do not choose CS fields (e.g. Berdousis & Kordaki, 2019; Viera & Couto, 2020), all the lectures in this course were presented by a female lecturer who talked about her previous work with databases. This may have served as a demonstration that working with databases is also suitable for women.

### 3.2 Gender Differences in Behavioural Engagement

The gender differences in behavioural engagement were studied as the second research question. Based on the data from Moodle LMS, there was no statistically significant gender difference in the attendance at practicals (with Mann-Whitney U-test  $U=10208.5$ ,  $p=0.535$ ). On average, male students attended 8.5 ( $SD=2.65$ ) and female students attended 8.8 ( $SD=2.34$ ) out of 12 practicals. Similarly, there were no statistically significant differences between male and female students in submitting SQL tasks (averages respectively 4.8 ( $SD=1.72$ ) and 4.9 ( $SD=1.73$ ), with Mann-Whitney U-Test  $U=110470.0$ ,  $p=0.294$ ) nor in the number of quiz solutions (averages respectively 2.7 ( $SD=0.81$ ) and 2.8 ( $SD=0.72$ ) with Mann-Whitney U-Test  $U=11637.5$ ,  $p=0.636$ ). There was also no gender difference in team project submissions (with chi-square=0.608, Monte Carlo Exact test  $p=0.296$ ), as 93.4% of the males and 95.7% of the females submitted their team project. These results do not align with previous studies suggesting that females are more active in course activities (e.g., Luik, 2024; Nja et al., 2019; Wang et al., 2023). Geist and King (2008) proposed that women may participate more in course activities because the nature of these activities is better suited to them than to men. However, in our study, there were no statistically significant differences in the ratings of course activities between genders. This could indicate that, since the activities were designed to suit both genders, no differences in participation were found.

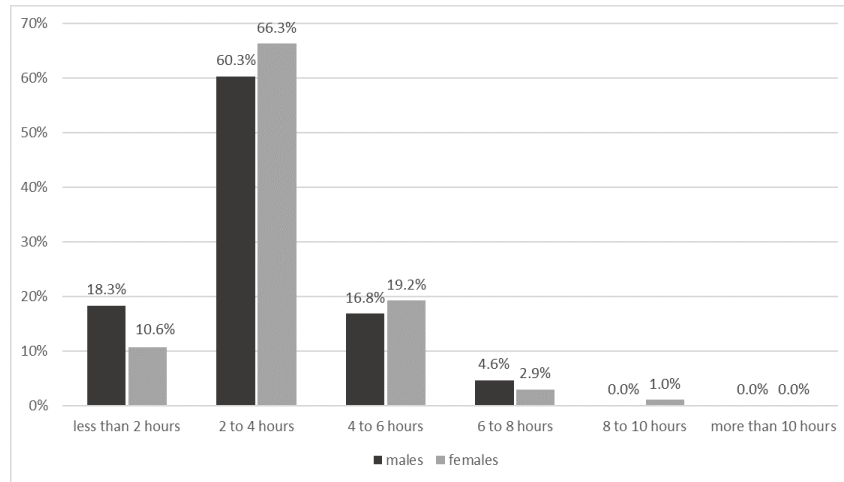
However, comparison of the students' questionnaire responses revealed that solving self-assessment tests in reading materials was the only course activity with no statistically significant difference. In all other activities, females reported higher behavioural engagement than males (Table 3). These results support the findings of previous studies (e.g. Bru et al., 2021; Lietaert et al., 2015), which are also based on the questionnaire responses and indicate that females are more active in courses in terms of behavioural engagement. It is possible that females view more video lectures, solve more self-assessment tests in video lectures, prepare more for practicals, read more learning materials, because YeckehZaare and Resnick (2019) also found that females read more learning materials. It is worth mentioning that all those results indicate that, after the regular contact activities and compulsory assignments, females try to learn using different sources provided by course instructors. However, it is worth to point out that although females reported higher behavioural engagement in the questionnaire, no gender differences were observed in practical participation or task submission rates. It might be that females tend to rate their own behavioural engagement higher, while males rate theirs lower.

**Table 3: Comparison of male and female students' ratings on behavioural engagement**

	Males M (SD)	Females M (SD)	U	p
Viewing video lectures	3.5 (1.21)	3.9 (1.17)	5621.5	0.017
Solving self-assessment tests in video lectures	3.4 (1.35)	3.8 (1.40)	5668.0	0.022
Reading learning materials	3.5 (1.17)	4.0 (1.01)	4984.0	<0.001
Solving self-assessment tests in reading materials	2.7 (1.25)	3.0 (1.26)	5944.0	0.086
Preparing for practicals	2.8 (1.11)	3.2 (1.19)	5382.0	0.004

Interestingly, there was no statistically significant gender difference in time per week spent on independent work on the course (chi-square=4.451, Fisher-Freeman-Halton Exact Test  $p=0.286$ ). Most students, males and females alike, spent 2 to 4 hours per week on independent work (Figure 1), which was the median. As males used fewer resources and activities provided by the course instructors, like video lectures, practicals, learning

materials, and self-assessment tasks, it might support the conclusion by YeckehZaare and Resnick (2019) that male and female students perform equally well in computer science courses but they use different pathways for studying.



**Figure 1: Assessment of course learners on their weekly use of time for independent learning in the course by gender.**

### 3.3 Gender Differences in Academic Help-Seeking and Using Troubleshooters

The last research question investigated gender differences in using academic help-seeking resources and attitudes toward using troubleshooters. The reported data on useful resources for finding academic help revealed no statistically significant gender difference (Table 4). Only one gender difference was found: females reported receiving more help from the reading materials in the Courses environment. Comparing the students' responses about the resources from which they received useful help, females reported statistically more than males that they were helped by the reading materials, and the result on receiving academic help was on the borderline. Both learning materials and video lectures are tools provided by course instructors. In conjunction with the results of the previous research question, it might be concluded that females tend to trust the tools provided by course instructors. This result aligns with Yang and Taylor's (2013) findings that female students report less help-seeking because of their lower self-efficacy. Maybe if females' self-efficacy is lower, they do not dare to trust other materials, fearing that they may provide wrong solutions to their problems. However, there was no statistically significant gender difference in receiving useful academic help from humans (peers and course instructors) and online resources outside the course. Similarly, no gender difference in seeking help from instructors was found in the study by Hao et al. (2016).

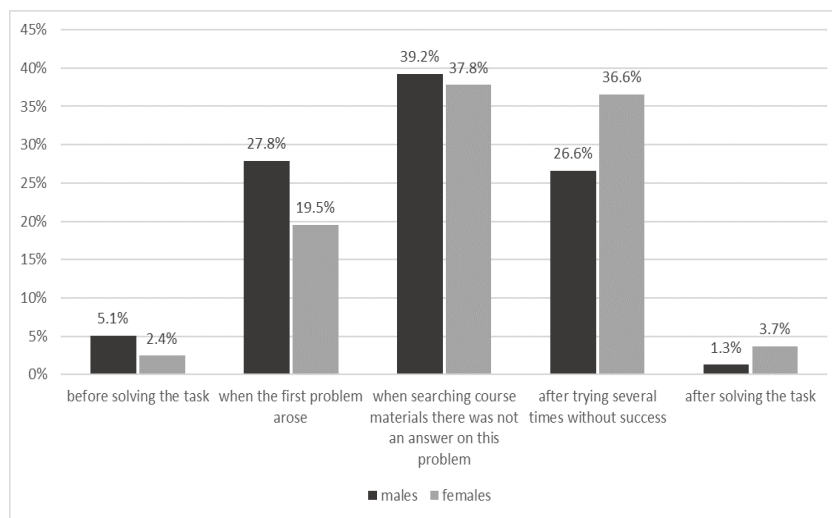
**Table 4: Receiving academic help from different resources by gender**

	Males n (%)	Females n (%)	chi-square	P
Peers	24 (18.3%)	18 (17.3%)	0.041	0.840
Instructors	33 (25.2%)	29 (27.9%)	0.217	0.642
Reading materials	66 (50.4%)	73 (70.2%)	9.416	0.002
Video lectures	26 (19.8%)	31 (29.8%)	3.131	0.077
Artificial intelligence	10 (7.6%)	6 (5.8%)	0.318	0.573
Internet sources	19 (14.5%)	14 (13.5%)	0.052	0.819

Still, gender differences in seeking academic help depend on specific resources. It was found that males used more AI tools, and females used more troubleshooters. 124 males (94.7%) and 89 females (85.6%) had used AI tools at least once during the course (chi-square=5.652, p=0.017). 80.2% of males (105) and 90.4% of females (94) had used troubleshooters (chi-square=4.679, p=0.031). Again, it should be mentioned that troubleshooters were tools provided by the instructors, and they correspond exactly to the particular SQL task. When using AI,

the students needed to ask questions in order to receive help. As indicated by previous studies (e.g. Berdousis & Kordaki, 2019; Viera & Couto, 2020), males feel more confident in CS and therefore they can be more likely to try to find help from outside. This might also explain the result of the previous research question that males report using less course resources, without there being any gender difference in the study time. It may be that males spend more time asking for help from AI than relying on course materials. Another explanation could be that the course materials were produced by a female teacher and the explanations and examples in the materials may have been less pertinent for males. As Adams et al. (2024) found, several students use ChatGPT for explaining learning material, making the content more understandable and providing more examples.

As troubleshooters have been an effective tool for providing adaptive online academic help, the use of this tool was studied in more detail. There was no statistically significant difference between male and female responses on the situations in which they turned to the troubleshooter ( $\chi^2=8.120$ ,  $p=0.229$ ). More than one-third of students of both genders sought help when they did not find an answer to their problem in the course materials (Figure 2). However, only less than one-fifth of females opened the troubleshooter as soon as the first problem arose, and one-third of females turned to the troubleshooter after trying several times without success. In the case of males, both scenarios occurred in approximately one-fourth of the cases.



**Figure 2: Males' and females' responses on the situations in which they used the troubleshooter**

Comparing the attitudes towards using troubleshooters (Table 5), females gave higher ratings to the positive statements and males to the negative ones. Females were significantly more motivated to solve SQL tasks and turned less to instructors for help than males.

**Table 5: Comparison of male and female students' attitudes towards using troubleshooters**

	Males M (SD)	Females M (SD)	U	p
Troubleshooters were useful.	3.2 (1.00)	3.2 (1.10)	3007.0	0.408
Troubleshooters provided enough information.	2.7 (0.84)	2.7 (0.88)	3173.5	0.598
The problem solvers helped me finish solving the task if there were problem areas.	3.4 (1.29)	3.5 (1.20)	5429.5	0.478
Troubleshooters helped me solve the tasks more on my own without turning to peers for help.	3.4 (1.46)	3.7 (1.33)	5130.5	0.165
Troubleshooters increased my motivation to solve SQL tasks.	2.7 (1.45)	3.2 (1.41)	4628.5	0.012
Troubleshooters reduced stress in solving the tasks.	3.1 (1.43)	3.5 (1.34)	4896.5	0.057
Troubleshooters reduced the time spent on tasks.	3.3 (1.35)	3.3 (1.29)	5701.0	0.926
I had to ask less from instructors.	3.1 (1.45)	3.4 (1.48)	4853.5	0.045

	Males M (SD)	Females M (SD)	U	p
Troubleshooters are good because they prevent others from finding out that I had problems solving the task.	2.9 (1.40)	3.1 (1.39)	5365.5	0.396
Troubleshooters do not promote the development of my own thinking.	2.0 (1.00)	1.6 (0.73)	4383.0	0.001
Because of the troubleshooters, I did not learn as much as I would have without them.	1.9 (1.06)	1.5 (0.67)	4316.0	0.001
Troubleshooters make it harder for me to pass the first part of the exam because I am too used to them.	2.0 (1.24)	1.8 (1.05)	5329.0	0.321

The difference was on the borderline regarding the statement that troubleshooters reduce stress in solving SQL tasks. Females also agreed more strongly that troubleshooters reduced the need to ask from instructors. As previous research has found that female help-seeking is correlated with the reliability of the instructor (Oh et al., 2024) and linked with the females' lower self-efficacy (Kori & Luik, 2020; Viera & Couto, 2020), it may be that females prefer to ask help from troubleshooters instead of instructors.

On the other hand, male students rated significantly higher than females the statements that troubleshooters do not promote development of independent thinking and they did not learn as much with troubleshooters as they would have without using them. The explanation might be the fact that almost one-third of males turned to troubleshooters before solving the task or as soon as the first problem appeared without trying to solve the problem on their own with the help of study materials. This makes it difficult to learn and it indicates that males are more likely to use the expedient type of help-seeking, whereas females try to use the adaptive approach.

#### 4. Conclusion

The aim of this study was to detect gender differences in behavioural engagement, academic help-seeking, satisfaction and attitudes in an introductory database course where no gender differences were found in achievements. The results indicate that, despite there being no significant differences in satisfaction and attitudes, female and male students do learn differently and use different tools for seeking academic help. Therefore, it is important for course designers to be aware of these differences to ensure availability of support tools for both genders. In addition, females could be encouraged to use resources outside of those offered by course instructors.

The study has some limitations. Not all participants of the course filled in the questionnaire and it is possible that the students who responded were more motivated and active in the first place; in addition, the share of respondents was higher among female students compared to the proportion of females among the course participants. The study was conducted at one university, which may also limit generalizability of the findings.

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