

## Article

# Difference in the Attitude of Students and Employees of the University of Ljubljana towards Work from Home and Online Education: Lessons from COVID-19 Pandemic

Varineja Drašler, Jasna Bertonec, Mojca Korošec, Tanja Pajk Žontar, Nataša Poklar Ulrich and Blaž Cigić \*

Biotechnical Faculty, University of Ljubljana, SI-1000 Ljubljana, Slovenia; varineja@gmail.com (V.D.); jasna.bertonec@bf.uni-lj.si (J.B.); mojca.korosec@bf.uni-lj.si (M.K.); tanja.pajk@bf.uni-lj.si (T.P.Ž.); natasa.poklar@bf.uni-lj.si (N.P.U.)

\* Correspondence: blaz.cigic@bf.uni-lj.si; Tel.: +386-1-320-37-84; Fax: +386-1-256-57-82

**Abstract:** The COVID-19 pandemic caused a large and involuntary shift to work from home (WFH) or teleworking, and widespread adoption of web-based platforms. This study aims to uncover the attitude and perception of WFH and online education among students and employees of the University of Ljubljana. A web-based questionnaire survey was conducted in November 2020, and more than 1300 valid responses were received. The lack of daily commuting, improved eating habits, and more time available for a family were the main reported advantages of WFH. The main issues, highlighted by respondents, were higher stress levels, lower study/work efficiency, and poorer working environment at home. When comparing the online educational process with the traditional one, the absence of traditional laboratory work, inadequate social interactions, and limitations of online knowledge assessment were identified as drawbacks by both students and educators. A significant difference between students and educators was observed in their opinion on the efficiency of online lectures compared to traditional ones, with the former being significantly more favored by students than educators. Overall, the majority of the respondents from all groups wish for the pre-COVID-19 study/work mode to be established as soon as possible. This implies that the perceived drawbacks of online education outweigh its advantages.

**Keywords:** students; educators; university; work from home; online education; distance learning; commute time; pandemic; COVID-19; Slovenia

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## 1. Introduction

The great rise of internet-based technologies in recent years has led to their incorporation into everyday activities. Our habits of social communication, purchasing of various services and goods, and media consumption have been greatly changed. Information technologies, in principle, also enable work from home (WFH) and teleworking in general.

There are many dimensions that are important with regard to WFH. One of the most obvious is time management, with the lack of commuting and the ability to choose optimal working hours being seen as beneficial. The ability to care for family members or WFH in case of a minor illness also has a positive connotation. Nevertheless, there are also some issues that may have a negative implication. Blurred boundaries between professional and personal life, distractions present in the home working environment, social isolation and lack of communication, suitability of working place, and decreased motivation, especially in long-term arrangements, are the main perceived threats [1].

Telework can be done from a variety of locations, but during the COVID-19 pandemic it was mostly WFH, where other family members were also present. Increased leisure and family time, and the opportunity for women with children to work, were some

of the reported benefits of WFH in previous studies [1]. On the other hand, WFH could lead to an increase in working hours, which has a negative impact on work–life balance, which may be associated with gender inequality [2]. One more possible risk of the impact of WFH could also be related to the inequality of employees, as higher educated and higher earners may benefit more from WFH [3]. From another perspective, WFH also has an impact on peoples' lifestyle and environment. It was firstly assumed that WFH would lead to lower energy consumption and lower environmental impact as a consequence of reduced commuting. However, recent studies have shown that WFH may actually lead to less sustainable practices due to an increase in home energy consumption and non-work-related traveling [4]. Partial WFH may represent the optimal arrangement for employees with longer commute time, leading to a greater geographical expansion of the labor market, which can be beneficial for both employers and employees [5]. There is undoubtedly a large gap between the feasibility of WFH and its actual realization, especially among those in full employment. Recent analyses have shown that teleworking at home is spreading to precarious, temporary, and lower-paid jobs [6]. The percentage of those employed in the public sector who are fully engaged in WFH remains generally low.

One of the activities that can be undertaken as a part of WFH mode is online education. Prior to the COVID-19 pandemic, online lectures were practiced mainly for part-time students, while for regular students, online education was rarely practiced by the public universities engaged in higher education. Nevertheless, online education has been on the rise in recent years, which has led to an increasing number of research papers devoted to this topic [7]. The main research topics were related to learner characteristics, expected outcomes, and students' engagement. The focus was also on the design of courses, delivery of topics, use of new technologies, and quality of assessment and evaluation of knowledge. One of the major challenges in online education is to develop a sense of community in the online environment despite the lack of face-to-face interaction [8]. During online lectures, students feel more disconnected from instructors and peers than professors believe [9]. In general, online learning puts more pressure on students [9], and personality traits, such as neuroticism, can have a negative impact on the participants of online courses [10].

Since March 2020, the world is battling the COVID-19 pandemic. Due to measures aiming to prevent the spread of the coronavirus, many people were faced with the involuntary shift to WFH and sudden adoption of web-based platforms.

Before the COVID-19 pandemic, only 5% of the working population in the European Union (EU) worked fully from home [11]. According to data from 2019, the share of people in the EU who WFH was 14.3% [12], and Slovenia was slightly above average (18.1%). There are also estimations that 37% of jobs in the USA [13] and 40% of jobs in Germany could be done as telework, but still the actual adoption rate before the COVID-19 pandemic, in Germany was nevertheless only 12% [14]. During the COVID-19 pandemic, the ratios have changed greatly, as the percentage of those regularly practicing WFH has increased from 5% to 37% in Europe only [11].

The situation was even more potentiated in the higher education sector, where there was a drastic shift from zero to full WFH and online activities for the majority of students and educators as well as other university employees. The pandemic can therefore be seen as an 'immersive laboratory' where acceptance of WFH and online education are being assessed in a real time with unconditional participation. The data obtained during the pandemic will undoubtedly influence future trends regarding distance working [15] and learning. Numerous papers have already been published in relation to WFH and higher education adjustments during COVID-19 pandemic. On 20 April 2021, more than 1500 manuscripts with the words "covid", "education", and "online" in their abstracts were listed in the Web of Science database. The majority focus on the beginning of pandemic, in spring 2020 and describe different practices and changes compared to previous systems. The so-called first wave of the pandemic was a big shock to all of us, and the transi-

tion to WFH and online education was a very emotional event. Therefore, the results regarding the general acceptance of WFH and online education obtained at the beginning of the pandemic, may possibly be biased by the perception of novelty. Indeed, it was observed that the attractiveness of online education decreases with the longer time that the situation lasts [16].

The COVID-19 pandemic will have a long-lasting impact on WFH and online education [17]. In the time of normalization, the proportion of online activities will be reduced, but it will undoubtedly remain higher than before 2020. Therefore, it is important to obtain as much data as possible in the time of pandemic when the general population is engaged in such activities involuntarily. There are important questions about WFH and online education related to gender [18], age [19], and financial situation [3]. WFH undoubtedly influences our eating habits [20] and level of physical activity [21], as well as leisure time [2].

The aim of our study was to investigate the attitudes and perceptions of students and employees at the University of Ljubljana toward WFH and online education. Their cumulative and group responses about organizational and efficiency aspects of WFH and social and personal aspects are presented. In addition, students and educators evaluated various parameters of the online educational process. Additionally, the influence of gender, age, financial status, and commute time on the various parameters related to WFH and online education were analyzed. Additionally, our survey was conducted in November and December 2020, about nine months after the beginning of the pandemic and transmission to new working and studying systems. In that time, the attractiveness of novelty has already diminished, and our results regarding attitudes toward WFH and online education could therefore be considered more realistic.

## 2. Materials and Methods

### 2.1. Situation

Slovenia is a country that was among the most affected by the so-called second wave of the COVID-19 pandemic. Our web-based structured self-reported questionnaire was active from 25 November to 9 December 2020, during the hard lockdown period, when the daily number of new infections was over 700 per million people and the daily number of deaths was on average 25 per million people. These numbers are higher than those reported by Italy or Spain, countries with the highest prevalence of infections and deaths in the first wave of pandemic in spring 2020. Many strict measures were set by Slovenian government at this time. Curfew was applied from 21:00 p.m. to 6:00 a.m., and crossing municipal boundaries was allowed only with specific permissions. All on-site educational activities at the University (lectures, laboratory exercises, seminars, and exams) were banned and transferred to the web-based platforms (mainly Microsoft teams, Zoom, and Cisco Webex). Students had to study from home, while university employees were able to choose between WFH or work in offices and laboratories at their own faculties.

### 2.2. Questionnaire

The research of this paper was based on the data collection using a structured questionnaire addressed to students and employees at the University of Ljubljana. The survey was conducted using the web-based software OneClickSurvey (<https://www.1ka.si/d/en>, last accessed on 30 April 2021, Version 21.02.16, Faculty of Social Sciences, University of Ljubljana, Ljubljana, Slovenia). In the questionnaire, Slovenian language was used. The enrolment was voluntary and anonymous. The data were self-reported.

Questionnaire was divided into three sections (Appendix A). The first section consisted of questions regarding to socio-demographic and economic status of respondents. They were asked to define their gender, the University where they study/work, status at the University, year of birth, daily commute time to study/work, financial situation, and change in financial situation during the COVID-19 pandemic. The second section included

questions about organizational, efficiency, social, and personal aspects of WFH. The last section was dedicated to online education and was intended for students and educators only. For most questions, respondents were able to choose from a three-point scale (agree, disagree, neutral). The future percentage of online education activities was proposed with the scale within the range from 0% to 100%, with intervals of 10%.

All employees at the University of Ljubljana received the introductory e-mail with the web-link to the survey. Students were recruited by the University career center, which is the primary node for addressing the students of the University directly by e-mail. The questionnaire was further disseminated through social networks (e.g., University/Faculty Facebook page). In total, 2039 respondents started the survey and 1327 of them fully completed the survey (only those were included in the data analysis), indicating a dropout rate of 35%; 734 employees who completed the survey represent approximately 12% of all employees at the University of Ljubljana, and 593 students who represent approximately 2% of all Bachelor and Master students at the University of Ljubljana. The sample size of all groups was representative of the target population [22]. According to gender, the survey was completed by 63% of females and 37% of males, where the gender structure of students is proportional to the population and slightly in favor of females in the sample of employees, as this population at the University of Ljubljana tends to be balanced by gender.

All respondents were divided into four groups according to their status at the University: 593 Bachelor and Master students (students), 332 employees primarily engaged in teaching (educators), 170 researchers and doctoral students (researchers), and 232 other university employees who are not engaged in teaching or research activities (others) completed the survey. The structure of the sample of employees is proportional to the target population.

### 2.3. Data Analysis

All obtained data were statistically analyzed using IBM SPSS Statistics 23. Numerical values were assigned to the responses agree: 2, disagree: 0, and neutral: 1 prior to statistical analysis. The mean rank within each group was calculated and nonparametric tests were performed to evaluate whether there were statistically significant differences ( $p \leq 0.05$ ) between two (Mann–Whitney U test) or more groups (Kruskal–Wallis test). Where a statistically significant difference between groups was found, it was marked with superscript letters, with the letter “a” assigned to the group(s) with the highest statistically significant rank.

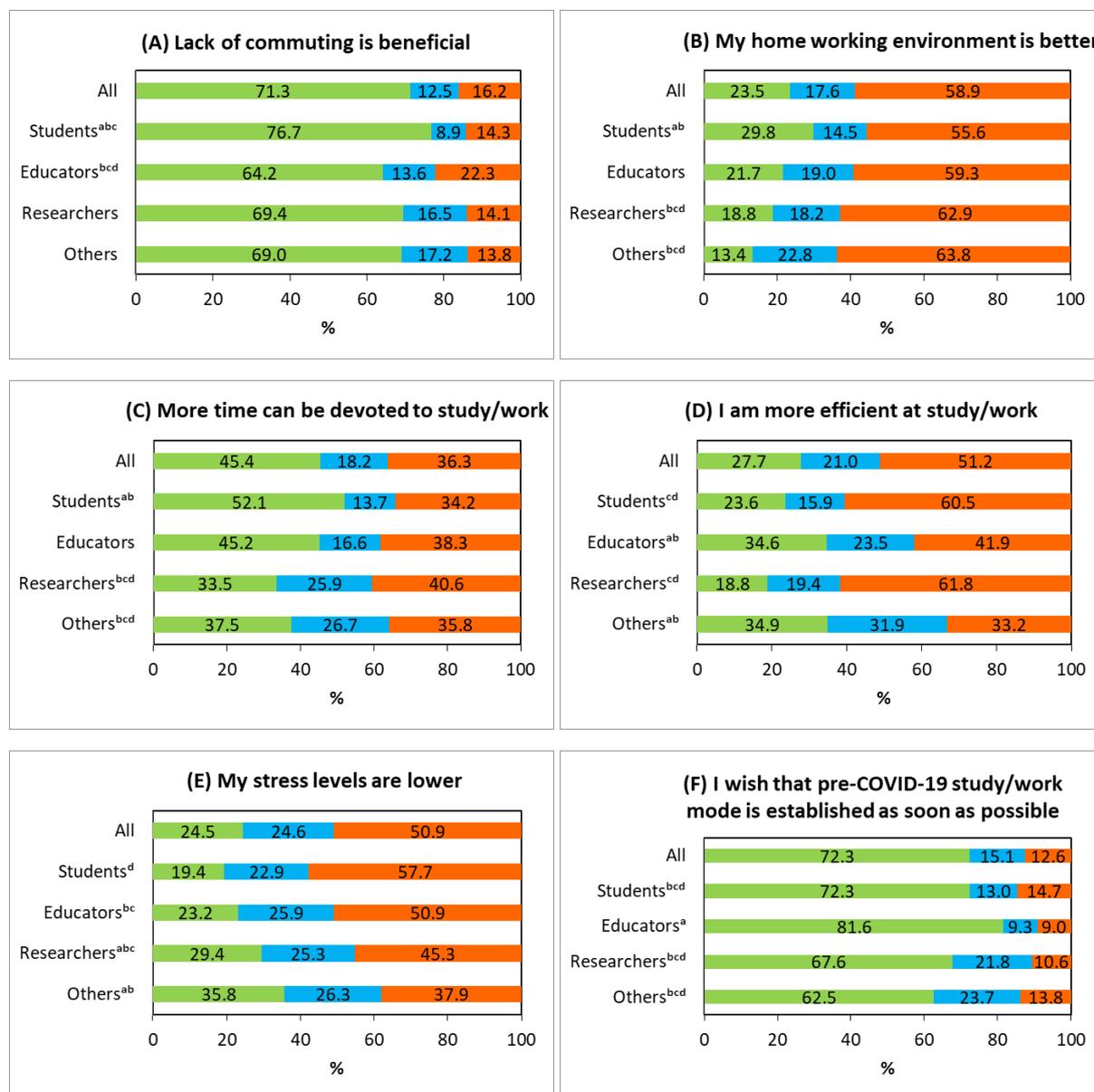
## 3. Results and Discussion

The results presented and discussed in this section exemplify the attitude of students and university employees toward WFH in different terms. The organizational and efficiency view is presented in Section 3.1, and social and personal aspects in Section 3.2. Comparison between online and traditional educational process in the view of students and educators is discussed in 3.3. Differences in the acceptance of WFH and online education depending on gender, age, financial status, and commute time are studied in Sections 3.4–3.7. Results are presented in form of Likert plots, box plots, and tables. The findings are shown in Figures 1–4 and Tables 1–5.

### 3.1. The Attitude of Students and University Employees toward WFH—Organizational and Efficiency Aspects

Daily commuting is an important factor contributing to the acceptance of WFH. That is supported by the fact that more than 70% of the respondents agreed with this statement (Figure 1A). The results are consistent with a large survey of commuters in England [23], which showed a strong association between longer commute time and lower job and leisure satisfaction, increased stress levels, and poorer mental health. Students reported the

highest percentage of benefit (77%), and their responses were significantly different from educators (64% positive). The difference may be related to the greater percentage of students who on average spend more than 90 min commuting (23%) compared to educators (15%).



**Figure 1.** The attitude of students and university employees toward organizational and efficiency aspects of WFH: (A) Lack of commuting is beneficial, (B) My home working environment is better, (C) More time can be devoted to study/work, (D) I am more efficient at study/work, (E) My stress levels are lower and (F) I wish that pre-COVID-19 study/work mode is established as soon as possible. Green color indicates agreement with the statement, orange color indicates disagreement with the statement, and blue color indicates a neutral attitude. Superscript letters (a–d) indicate statistically significant differences ( $p \leq 0.05$ ) between groups (Kruskal–Wallis test).

The working environment at home is on average less suitable for all respondents, as only 24% find it better compared to 59% who disagreed with the statement (Figure 1B). The suitability of the home workspace is among the most important parameters influencing effectiveness and satisfaction of WFH [1]. Students represent the group who found their work environment at home relatively better (30%) than educators (22%), researchers (19%), and others (13%). Since many researchers are bound to work in the laboratory, the

largest proportion of those with negative responses was expected. The highest proportion of positive responses in the group of students can also be explained by much lower likelihood of distraction from other family members (e.g., young children) and the fact that, unlike other groups, they do not have a fixed working place at the university.

In general, the proportion of respondents who reported they could devote more time to study/work when working from home (45%) is greater than that of those who reported working less when WFH was performed (36%) (Figure 1C). Nevertheless, there are relatively large differences between groups, as students devoted significantly more time to study/work than researchers and others, whereas educators did not significantly differ from other groups in their workload. The higher student workload is consistent with previous observations where students perceived online courses as being more self-directed and believed they must be more willing to study on their own compared to traditional courses [9]. A larger percentage of students with longer commute time could additionally contribute to more time available for studying.

More respondents reported being less efficient during WFH (51%) compared to those who were more efficient (28%) (Figure 1D). The results of another study conducted during the COVID-19 pandemic showed that employees reported higher efficiency when working from home in higher percentage [24], which was also observed in our study for the group of educators (35%) and others (35%). Students (61%) and researchers (62%) reported significantly lower efficiency, which could be related to the fact that laboratory exercises were only simulated and not conducted in the actual laboratory. In addition, the constant availability of the computer for leisure-like activities may also lead to higher distraction and lower efficiency, as has been observed previously [25]. In particular, researchers in the science and technology fields were also unable to work in the laboratories, most likely resulting in estimations of their efficiency.

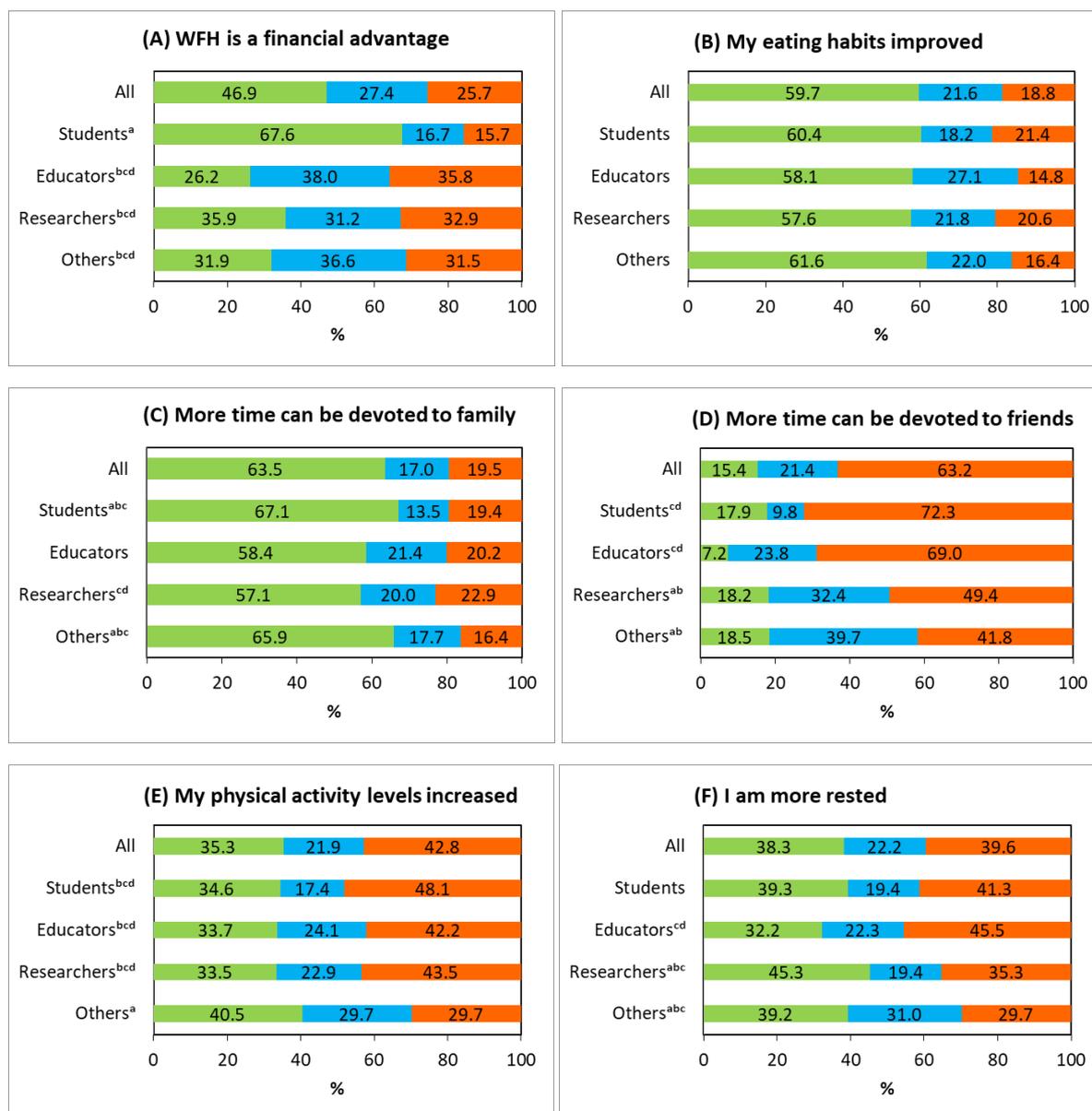
WFH caused higher stress levels for 51% of respondents compared to 25% whose stress levels were lower (Figure 1E). Conflict between work and family demands generally leads to higher stress levels [26]. In our study, students were statistically more stressed (58%) than other three groups, which is not surprising, since they spent more time studying (Figure 1C) and were one of the least efficient groups at their study/work (Figure 1D). A higher level of stress among students compared to educators was also observed in another study [27]. Anxiety associated with online examination could contribute to higher levels of stress [28]. Another factor that was not the direct result of WFH, but rather related to pandemic restrictions, is the lack of social interaction, leading to higher levels of anxiety and depression in young adults [29].

Establishing a pre-COVID-19 study/work mode, compared to WFH, is supported by 72% of all respondents, while only 13% would like to continue with current practices (Figure 1F). Educators represent the group that significantly wanted to return to the on-site work in highest proportion (82%). Such results are somehow surprising, especially in relation to students (72%), who were statistically less efficient at study/work (Figure 1D) and more stressed (Figure 1E) compared to educators. Clearly, the lack of commuting (Figure 1A) and, for some students, relatively better home working environment (Figure 1B) were more important parameters contributing to the overall decision. There was also a statistically significant difference between responses of educators (82% positive) and others (63% positive). They reported similar levels of efficiency (Figure 1D), but educators had higher stress levels (Figure 1E), which consequently led to a more positive attitude toward the traditional system.

### *3.2. The Attitude of Students and University Employees toward WFH—Social and Personal Aspects*

WFH represented a major financial advantage for students (68%), while in the other three groups, finances were less relevant factor related to WFH (Figure 2A). The University of Ljubljana is a public university, and students enrolled in regular programs do not have to pay tuition fees; therefore, this should not be a financial problem for most of them.

The financial burden is mainly related to paying the rent of the accommodation in time of study and transport costs. Moving back home during the COVID-19 pandemic could be an important factor contributing to financial advantage of students. Losing a part-time job during the COVID-19 pandemic was problematic for some students, but generally this problem was even larger in less developed regions of Africa and Asia than in Europe [30]. Additionally, in each of the two waves of the pandemic, there were some government grants given to all students. The higher proportion of neutral responses in other three groups (31–38%) might be due to their unchanged employment status and the fact that all employees in Slovenia still received some financial compensations (meals, use of their own resources during WFH) even when they worked from home.



**Figure 2.** The attitude of students and university employees toward social and personal aspects of WFH: (A) WFH is a financial advantage, (B) My eating habits improved, (C) More time can be devoted to family, (D) More time can be devoted to friends, (E) My physical activity levels increased and (F) I am more rested. Green color indicates agreement with the statement, orange color indicates disagreement with the statement, and blue color indicates neutral attitude. Superscript letters (a–d) indicate statistically significant differences ( $p \leq 0.05$ ) between groups (Kruskal–Wallis test).

Improved eating habits were uniformly a positive consequence of WFH, as 60% of respondents agreed with that statement (Figure 2B). A large survey conducted in the USA in years 2017 and 2018 showed that WFH significantly increases the amount of time spent for preparing and eating food [20]. Food prepared at home tends to be lower in energy and higher in nutrients, which is an additional benefit. Similar results were found among students in Turkey, where a shift toward healthier food choices was observed during the COVID-19 pandemic [31].

WFH has a significant effect on social interaction, at family and friend levels. In our study for all the observed groups, interaction with family intensified, as on average 64% of respondents were able to devote more time to family members (Figure 2C). In contrast, only 15% of respondents were able to devote more time to their friends, compared to 63% reporting decreased interaction with friends (Figure 2D). Larger relative differences between groups of employees are observed in terms of interaction with friends, where educators devoted significantly less time to friends (69%) compared to group of researchers (49%) and others (42%). The high percentage of students (72%) and educators (69%) who reported lower levels of interaction with friends may be associated with more time spent on study/work compared to the other two groups. A reduction in students' interactions associated with negative health trajectories has been previously described [32].

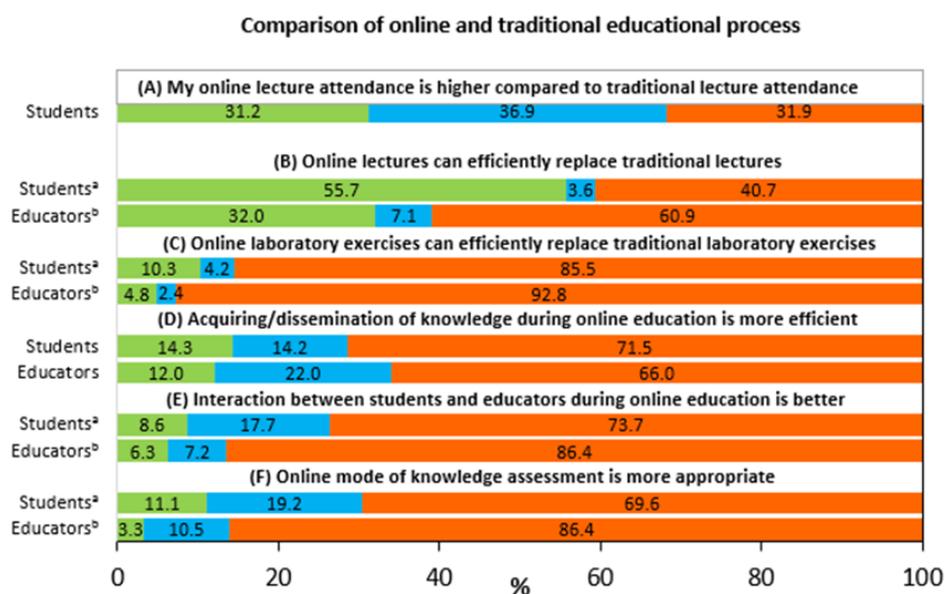
Physical activity is the parameter that is an important contributor to the overall well-being of the individual [33]. Only 35% of respondents reported that their physical activity levels increased during WFH, compared to 43% of those who were less physically active (Figure 2E). These results are consistent with other studies showing that physical activity levels in general decreased during the COVID-19 pandemic [34]. Our analysis showed that the group of others was statistically more physically active than other three groups, and among them, there was even a higher percentage of those who were more physically active (41%) compared to those who were less active (30%). Others spent less time working when WFH was practiced (Figure 1C), their stress levels were the lowest (Figure 1E), and they devoted relatively more time to friends (Figure 2D). Since their self-rated efficiency of work was still relatively high (Figure 1D), this group probably benefits the most from WFH.

The impact of WFH on peoples' restfulness is a complex issue. According to the results of our study, there is a similar percentage of respondents who were less (40%) and those who were more (38%) rested when WFH was practiced (Figure 2F). Lower frequency of daily commuting contributes to higher levels of restfulness, but on the other hand, intensification and extensification of work and overlap with household activities cause lower levels of restfulness [26]. There was a statistically significant difference in levels of restfulness among university employees. Educators were less rested (46%) than researchers (35%) and others (30%), and in these last two groups, the percentage of respondents who were more rested (39–45%) is even higher than of those who were more tired. A correlation between a higher percentage of telecommuting and tiredness among academics has also been previously observed in a Swedish study [35]. Lower levels of restfulness among educators most likely contributed to a significantly higher percentage of those who wished for the traditional study/work mode to be established as soon as possible (Figure 1F).

### *3.3. Comparison of Online and Traditional Educational Process—The Students' and Educators' Point of View*

Students' online lectures attendance was not significantly affected by the COVID-19 pandemic, as 31% of students reported higher online lecture attendance, in contrast to 32% whose online lecture attendance was lower compared to traditional on-site lectures (Figure 3A). The relative attendance in our study is slightly lower than reported in one of the previous surveys conducted in May 2020 among undergraduate students of health sciences in Croatia, where the observed ratio was 30% to 15%. The reason for the discrepancy may be the fact that motivation for online education declines with the longer it lasts [16],

as our survey was conducted about nine months after the beginning of the COVID-19 pandemic. During the pandemic, some educators practiced handing out recorded lectures to students, which may have also led to poorer online lectures attendance [36]. Students listening to recorded lectures and the ones attending on-site lectures showed no difference in final exam performance [37]. In the future, universities may even reconsider the need for traditional lectures at all [38], but further studies and evaluations are needed.



**Figure 3.** The attitude of students and educators toward online education compared to the traditional educational process. Green color indicates agreement with the statement, orange indicates disagreement with the statement, and blue indicates a neutral attitude. Superscript letters (a,b) indicate statistically significant differences ( $p \leq 0.05$ ) between groups (Mann–Whitney U test).

A higher percentage of students agreed (56%) that online lectures can efficiently replace traditional on-site lectures, and 41% of them disagreed with the statement. This ratio was reversed for educators (32% to 61%) and significantly different (Figure 3B). The educators' responses about acceptance of online lectures observed in our study were different from those of educators from German universities assessed in study conducted in spring 2020 during the first wave of pandemic, where not only students but also the majority of educators stated that theoretical teaching could be equally well covered by online lectures [39]. However, students' participation and acceptance of online lectures in our study is lower compared to observations from the first wave, when the online system was relatively new and therefore more attractive.

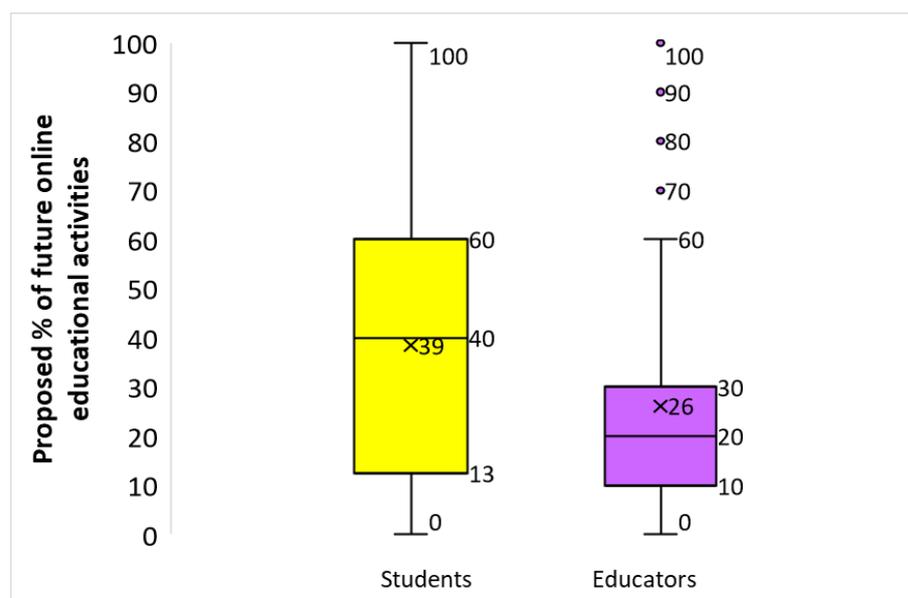
Only 10% of students and 5% of educators confirmed that online laboratory exercises can adequately replace actual presence in the laboratory (Figure 3C). Traditional laboratory work can be efficiently replaced by virtual laboratory tools only in some fields. Especially in science and engineering, the lack of practical skills and experience in analyzing and interpreting data is most problematic, which could have long-term consequences at a higher level of study or when entering a job market [40]. Chemistry students reported having problems writing laboratory reports for experiments that were not actually performed, demonstrating the importance of being present in the laboratory for understanding the subject of study [41]. However, incorporating virtual simulations of exercises into online education could, to some extent, improve students' acceptance of online laboratory exercises [42].

Seventy-two percent of students and 66% of educators found acquiring or disseminating of knowledge less efficient when online education was practiced (Figure 3D). One of the reasons could be the lack of interaction between students and educators during

online lectures, as this was highlighted as a negative factor by both students (74%) and educators (86%) (Figure 3E). Results are consistent with a Romanian study where inadequate communication and interaction between students and educators was perceived as one of the main threats if all educational activities were held online [43].

When students and educators were asked to directly compare the appropriateness of traditional and online modes of knowledge assessment, 70% of students and 86% of educators responded that the traditional mode was better (Figure 3F). A systematic review about online knowledge assessment in the “pre-COVID-19 era” found that there are negative and positive aspects of online examination. The main perceived threats were related to students’ anxiety related to technical issues, while educators were more concerned about the higher possibility of cheating among students. Time saving and better student performance were the most frequently cited benefits [44]. Many advantages and pitfalls of online examination were also identified in the survey of a relatively heterogeneous sample of students [45]. Students’ responses to online examination in some studies conducted during the first wave of COVID-19 pandemic were overwhelmingly positive [46–49] and therefore in disagreement with the results presented here. In our opinion, results of studies in which educators who conducted the assessments and later wrote the manuscripts and were very concerned about optimizing the online assessment should not be generalized. Dissatisfaction with the knowledge assessment performed by the heterogeneous population of educators (Figure 3F) is a more realistic indicator of the actual situation.

Both students (39%) and educators (26%) believe that some level of online educational activities should be maintained in the future, even when the current COVID-19 pandemic situation normalizes (Figure 4). Students indicated a significantly higher proportion of all educational activities to be maintained online in the future, which is consistent with the German study [39], but there reported percentages were higher for both groups (students 53% and educators 39%). The observed discrepancy might be due to decreased attractiveness of online education when it is lasting for a longer time [16], as participants in our study have been experiencing online education for more than nine months before the survey was conducted.



**Figure 4.** Proposed percentage of future online educational activities by students and educators presented in the form of a box plot. The minimum, the maximum, the sample median, and the first and third quartiles for each group are shown. x represents mean value. Outliers are plotted as individual points.

The broad perception of online lectures as an important part of the educational process, involuntarily created by the COVID-19 pandemic, will at least to some degree undoubtedly persist even when the current situation normalizes. A large survey among Spanish university professors found that the vast majority will still use so-called blended learning in the future [17]. A fully online university is a dystopian possibility, yet a complete return to the ‘pre-COVID-19’ educational process is unlikely to happen [50].

### 3.4. The Difference in the Acceptance of WFH and Online Education between Females and Males

Gender inequality in relation to WFH is an important issue. Answers reported by students and educators at the University of Ljubljana, presented in Table 1, showed that women in both groups were significantly more efficient at study/work when working from home. Additionally, female educators reported being able to devote more time to work. In contrast, most studies conducted before the COVID-19 pandemic found that women, when engaged in WFH, devoted significantly less time to work activities and more time to housework and childcare [51]. Some studies conducted during the COVID-19 pandemic also found that women reported lower productivity and job satisfaction compared to men when they were working from home [52]. Despite higher efficiency at study/work observed among female students, results presented in Table 1 also show that they were significantly more physically active than male students. That is most likely not just the result of WFH, but rather the influence of COVID-19 restrictions, as male students, who practice team sports in higher proportions [53], lost their daily routines to a greater extent. Additionally, more time devoted to study did not lead to higher stress levels among female students.

**Table 1.** The difference in acceptance of WFH and online education between females and males. Possible answers to each statement were agree, disagree, and neutral. Results are presented as mean ranks in each gender group and obtained for each parameter for students and educators (Mann–Whitney U test). The numbers of respondents are shown in parentheses. Red numbers and superscript letters (a,b) indicate statistically significant differences ( $p \leq 0.05$ ) between males and females for each group.

	Students				Educators			
	Female (332)	Male (261)	Chi-Square	Sig.	Female (217)	Male (115)	Chi-Square	Sig.
My home working environment is better	300	293	0.255	0.614	171	158	1.960	0.162
More time can be devoted to study/work	305	286	2.166	0.141	174 <sup>a</sup>	152 <sup>b</sup>	4.819	0.028
I am more efficient at study/work	311 <sup>a</sup>	280 <sup>b</sup>	6.304	0.012	174 <sup>a</sup>	153 <sup>b</sup>	4.155	0.042
My eating habits improved	301	292	0.614	0.433	172	156	2.900	0.089
My physical activity levels increased	309 <sup>a</sup>	281 <sup>b</sup>	4.607	0.032	166	167	0.000	0.994
My stress levels are lower	292	303	0.753	0.386	162	174	1.416	0.234
Online lectures can efficiently replace traditional lectures	302	290	1.031	0.310	167	165	0.041	0.840
I wish that pre-COVID-19 study/work mode is established as soon as possible	297	298	0.008	0.929	167	165	0.103	0.748
Higher suggested proportion of future online educational activities	295	280	1.238	0.266	165	156	0.642	0.423

However, the results obtained during the COVID-19 pandemic about attitude toward WFH regarding gender differ in relation to the time when they were conducted. In contrast to previous findings from the beginning of pandemic, the majority of new studies show that the relative benefits of WFH are higher for women. Results of a large survey from Lithuania about the attitude of the general population toward WFH during the COVID-19 pandemic [54] are similar to those in our study. Men reported significantly lower efficiency, while women were better at keeping up with their well-being. Women also reported significantly better time management. A more positive attitude toward

WFH among women was also reflected in a higher percentage of women fully engaged in WFH, like in our study, where the reported ratio of women and men fully engaged in WFH was 57% to 44%. More male educators (25%) had been working at their offices at the University every day, compared to women (10%), although they were all free to choose whether to work at University or from home during the second lockdown. A large survey among over 50,000 Twitter users found that women have more positive attitude toward WFH than men [55]. According to Table 1, it is likely that the greater burden of household activities, even more common among educators, was not a decisive factor in relation to acceptance of WFH. Female students and female educators reported relatively higher efficiency of study/work, and educators even spent more time working.

### 3.5. The Age-Related Differences in the Acceptance of WFH and Online Education

Table 2 presents the attitude toward WFH and online education among students and educators at the University of Ljubljana, both divided into groups according to their year of birth. Responses observed in the group of educators showed no statistically significant differences between different age groups. In the Lithuanian study [54], more differences were observed, where older generations and less educated respondents expressed some disadvantages of WFH, mainly related to the lack of knowledge about new technologies. Since educators at the university are on average familiar with new technologies, this factor was less relevant in our study than for the general population.

**Table 2.** The difference of acceptance of WFH and online education in relation to year of birth. Possible answers to each parameter were agree, disagree, and neutral. Results are presented as mean ranks in each chosen birth cohort and obtained for each parameter for students and educators (Mann–Whitney U test). The numbers of respondents are shown in parentheses. Red numbers and superscript letters (a, b) indicate statistically significant differences ( $p \leq 0.05$ ) between different birth cohorts.

	Students				Educators					
	2001 (126)	1996–2000 (407)	Chi-Square	Sig.	1981-younger (76)	1973–1980 (85)	1965–1972 (94)	Elder-1964 (77)	Chi-Square	Sig.
My home working environment is better	260	269	0.373	0.541	159	158	165	184	4.704	0.195
More time can be devoted to study/work	270	266	0.083	0.773	174	149	174	170	4.820	0.185
I am more efficient at study/work	262	268	0.215	0.643	187	153	162	166	6.241	0.100
My eating habits improved	232 <sup>b</sup>	278 <sup>a</sup>	11.270	0.001	180	167	165	154	3.621	0.305
My physical activity levels increased	251	272	2.162	0.142	181	165	163	157	3.050	0.384
My stress levels are lower	270	266	0.087	0.767	176	154	161	178	4.307	0.230
Online lectures can efficiently replace traditional lectures	246 <sup>b</sup>	274 <sup>a</sup>	4.313	0.038	172	177	162	155	3.473	0.324
I wish that pre-COVID-19 study/work mode is established as soon as possible	268	267	0.024	0.876	162	168	174	160	2.779	0.427
Higher suggested proportion of future online educational activities	244	265	1.795	0.180	161	155	169	161	1.024	0.795

The highest median score for older educators was found in relation to a better work environment at home, which is consistent with the findings that older generations highly value their personal space [54]. Narrowing the gap between younger and older people in relation to their familiarity with computers and new technologies and finding that the extent of work that can be done from home increases with age [19] suggests that WFH is feasible for the elderly as well.

Comparison of responses about attitude toward WFH and online education, observed for students of different ages, showed that there was a statistically significant difference between first-year students (born in 2001) and older students (born in 1996–2000). As can be seen in Table 2, first-year students had poorer eating habits and did not find online lectures a suitable replacement for traditional lectures. The latter is extremely important and points to the problem of properly introducing new students. Those students, participating in our survey, had been physically present at the University for only three weeks before the beginning of lockdown in autumn, which was insufficient for a proper

introduction to the university system. Other factors, such as social networks, which are already established among older students, could also contribute to a relatively lower acceptance of online education among first-year students.

### 3.6. The Influence of Financial Status and Change in Financial Status during the COVID-19 Pandemic on the Acceptance of WFH and Online Education

Results in Table 3 show that financial status is not a very important factor determining the acceptance of WFH and online education among students and educators at the University of Ljubljana. Only in the group of students, their eating habits were significantly poorer for those with below average financial status. That could be a consequence of the specificity of the Slovenian governmental system, which provides subsidies for meals at some restaurants for all students. During the COVID-19 pandemic, restaurants were closed; consequently, this benefit was lost, resulting in poor nutrition for the financially weakest group of the population.

**Table 3.** The difference in acceptance of WFH and online education among different financially situated groups. Possible answers to each parameter were agree, disagree, and neutral. Results are presented as mean ranks in different financial status (below average, average, and above average) and obtained for each parameter for students and educators (Kruskal–Wallis test). The numbers of respondents are shown in parentheses. Red numbers and superscript letters (a–c) indicate statistically significant differences ( $p \leq 0.05$ ) between groups with different financial status.

	Students					Educators				
	Below Average (73)	Average (320)	Above Average (187)	Chi-Square	Sig.	Below Average (29)	Average (99)	Above Average (191)	Chi-Square	Sig.
My home working environment is better	282	283	306	3.058	0.217	172 <sup>ab</sup>	140 <sup>c</sup>	169 <sup>ab</sup>	8.785	0.012
More time can be devoted to study/work	267	287	306	3.985	0.136	150	164	159	0.617	0.735
I am more efficient at study/work	283	288	298	0.738	0.691	155	162	160	0.146	0.930
My eating habits improved	251 <sup>c</sup>	290 <sup>ab</sup>	307 <sup>ab</sup>	7.823	0.020	160	163	158	0.264	0.876
My physical activity levels increased	266	290	301	2.668	0.263	168	169	154	2.204	0.332
My stress levels are lower	273	298	285	1.959	0.376	178	162	156	1.724	0.422
Online lectures can efficiently replace traditional lectures	275	289	299	1.648	0.439	179	145	165	5.860	0.053
I wish that pre-COVID-19 study/work mode is established as soon as possible	289	287	297	0.766	0.682	139	163	162	3.670	0.160
Higher suggested proportion of future online educational activities	301	279	281	1.063	0.588	168	157	153	0.751	0.687

For educators, the only statistically significant parameter related to financial status was the quality of the working environment at home compared to that at the university. Here, educators with average financial status reported significantly lower quality of home-working environment compared to the other two groups with below or above average financial status. Educators with lower income are more likely to share their office at the University with co-workers, which relatively favors WFH for them. On the other hand, educators with above average financial situation are more likely to have a better standard of living and therefore better conditions for WFH. Consequently, educators with average financial status reported the least suitable home-working environment. The same trend was reflected in perception of acceptability of online lectures as a suitable replacement for traditional lectures, where educators with average financial status reported the highest disagreement, with results bordering on statistical significance ( $p = 0.053$ ) (Table 2). The reason for the relatively low influence of financial status in relation to WFH among educators could be the financial security of state employees, as the vast majority of them have permanent jobs. It was shown that financial and job insecurity were more important factors during COVID-19 pandemic measures than absolute income [56]. Similar findings were observed among students in Europe, since their personal concerns related to finances during the COVID-19 pandemic were rated as relatively low, and bigger threats of online education were study issues, future education, and impact on future career [30].

In contrast to the financial status, there were major differences between students and educators in terms of the change in their financial status caused by the COVID-19 pandemic (Table 4). Further, change in finances had a great impact on the acceptance of WFH and online education. During the COVID-19 pandemic, financial situation worsened for 30% of students and only for 10% of educators. Such a large difference is most likely the result of stable job position in the public sector, while students (and their families) are the part of the population that was potentially more exposed to changes caused by pandemic [57].

**Table 4.** The difference in acceptance of WFH and online education as a function of change in financial status during the COVID-19 pandemic. Possible answers to each parameter were agree, disagree, and neutral. Results are presented as mean ranks in groups with different changes in financial situation (worsened, no change, improved) and obtained for each parameter for students and educators (Kruskal–Wallis test). The numbers of respondents are shown in parentheses. Red numbers and superscript letters (a–c) indicate statistically significant differences ( $p \leq 0.05$ ) between groups with different change in financial status.

	Students			Chi-Square	Sig.	Educators			Chi-Square	Sig.
	Worsened (176)	No Change (337)	Improved (80)			Worsened (32)	No Change (262)	Improved (38)		
My home working environment is better	279	300	323	5.026	0.081	156	165	184	2.078	0.354
More time can be devoted to study/work	273 <sup>bc</sup>	299 <sup>b,c</sup>	341 <sup>a</sup>	10.915	0.004	160	169	155	0.985	0.611
I am more efficient at study/work	281 <sup>b,c</sup>	296 <sup>b,c</sup>	334 <sup>a</sup>	6.941	0.031	129 <sup>c</sup>	170 <sup>ab</sup>	174 <sup>ab</sup>	6.328	0.042
My eating habits improved	261 <sup>c</sup>	303 <sup>b</sup>	349 <sup>a</sup>	20.216	0.000	159	168	160	0.612	0.736
My physical activity levels increased	270 <sup>c</sup>	305 <sup>ab</sup>	323 <sup>ab</sup>	8.345	0.015	176	165	172	0.605	0.739
My stress levels are lower	270 <sup>c</sup>	307 <sup>ab</sup>	314 <sup>ab</sup>	8.232	0.016	143	170	166	2.669	0.263
Online lectures can efficiently replace traditional lectures	291	291	334	5.822	0.054	147	166	186	3.880	0.144
I wish that pre-COVID-19 study/work mode is established as soon as possible	300 <sup>ab</sup>	306 <sup>ab</sup>	253 <sup>c</sup>	10.041	0.007	170	164	179	1.711	0.425
Higher suggested proportion of future online educational activities	285 <sup>b,c</sup>	279 <sup>b,c</sup>	336 <sup>a</sup>	7.663	0.022	150	162	169	0.740	0.691

For seven out of nine statements shown in Table 4, students with a worsened financial situation reported statistically significantly more negative attitude toward WFH. Similar results were observed among Israeli workers during the COVID-19 pandemic, where attitude toward WFH was found to be strongly influenced by expectations regarding financial benefits [58]. Additionally, the Italian study observed that a positive shift regarding WFH feasibility was associated with an increase in average income [3]. In the student population, the concern about personal finances during the COVID-19 pandemic is global [30] and, as shown in Table 4, the number of students with a worsened financial situation is twice as large than of those whose financial status had improved. During the lockdown, many students lost their part-time jobs in the service sector, whereas those who are highly skilled in new technologies were less affected and their income could even increase. Since good technical skills are important for effective engagement in online education [59], students with improved financial status were also the ones with better adaptation to the new system, and consequently reported a significantly higher percentage of online activities to be maintained in the future.

The association between financial gains and the perception of the quality of education could also be a sign of the marketization of the university [60], where “getting the degree” is more important than “getting the knowledge”. The consumerist approach is generally more pronounced in countries such as the UK, where most of the funding of higher education is students’ own responsibility, but can be also observed in countries such as Portugal, where state funding of higher education is prevalent, similar to Slovenia [61]. Universities are under constant pressure to generate income, and the growing segment of online education is a viable alternative to contribute to this. However, this practice is not without disadvantages, as there is a great risk of separating educational content from educational experience, which can lead to the disaggregation of education [62].

Online education is inextricably linked to financial issues, as even before the COVID-19 pandemic, online courses were launched by public universities, especially for part-time students, with the aim of improving their financial situation amidst decreasing government funding. Data on the acceptance of online education and WFH by students and educators, their weaknesses and strengths, are important to optimize future educational activities when pursuing financial, pedagogical, and sustainability goals.

### 3.7. The Influence of Commute Time on Acceptance of WFH and Online Education

Daily commute time is an extremely important factor in terms of acceptance of WFH and online education for both, students and educators (Table 5). In the group of students there was a statistically significant difference observed for all nine parameters related to WFH and online education. Higher scores and therefore more positive attitude toward WFH were reported by students with a commute time of more than 90 min, especially compared to those with commute time of less than 30 min. Similar results were found among educators, meaning significantly higher scores were observed for the group with the longest commute time compared to those with the shortest commute time, but in this case only for six out of nine parameters. We can conclude that for educators, commute time was not a significant factor affecting the acceptance of online education.

**Table 5.** The difference in acceptance of WFH and online education in relation to commute time. Possible answers to each parameter were agree, disagree, and neutral. Results are presented as mean ranks in groups with different commute times (0–30, 30–90, or more than 90 min) and obtained for each parameter for students and educators (Kruskal–Wallis test). The numbers of respondents are shown in parentheses. Red numbers and superscript letters (a–c) indicate statistically significant differences ( $p \leq 0.05$ ) between groups with different commute times.

	STUDENTS			Chi-Square	Sig.	EDUCATORS			Chi-Square	Sig.
	0–30 min (197)	30–90 min (260)	>90 min (136)			0–30 min (118)	30–90 min (163)	>90 min (51)		
My home working environment is better	272 <sup>b,c</sup>	300 <sup>a,b,c</sup>	326 <sup>a,b</sup>	10.175	0.006	155 <sup>b,c</sup>	168 <sup>a,b,c</sup>	190 <sup>a,b</sup>	6.441	0.040
More time can be devoted to study/work	278 <sup>b,c</sup>	300 <sup>a,b,c</sup>	319 <sup>a,b</sup>	5.993	0.050	150 <sup>b,c</sup>	171 <sup>a,b,c</sup>	192 <sup>a,b</sup>	8.819	0.012
I am more efficient at study/work	272 <sup>b,c</sup>	292 <sup>b,c</sup>	342 <sup>a</sup>	18.035	0.000	149 <sup>b,c</sup>	168 <sup>b,c</sup>	202 <sup>a</sup>	12.504	0.002
My eating habits improved	280 <sup>b,c</sup>	296 <sup>a,b,c</sup>	324 <sup>a,b</sup>	7.118	0.028	144 <sup>c</sup>	174 <sup>a,b</sup>	193 <sup>a,b</sup>	14.243	0.001
My physical activity levels increased	288 <sup>b,c</sup>	283 <sup>b,c</sup>	337 <sup>a</sup>	11.395	0.003	180 <sup>b,c</sup>	160 <sup>b,c</sup>	209 <sup>a</sup>	13.877	0.001
My stress levels are lower	275 <sup>b,c</sup>	291 <sup>b,c</sup>	340 <sup>a</sup>	15.577	0.000	157 <sup>b,c</sup>	163 <sup>b,c</sup>	200 <sup>a</sup>	8.889	0.012
Online lectures can efficiently replace traditional lectures	277 <sup>b,c</sup>	298 <sup>a,b,c</sup>	324 <sup>a,b</sup>	8.238	0.016	163	171	161	0.920	0.631
I wish that pre-COVID-19 study/work mode is established as soon as possible	318 <sup>a,b</sup>	309 <sup>a,b</sup>	244 <sup>c</sup>	28.020	0.000	174	164	157	3.239	0.198
Higher suggested proportion of future online educational activities	245 <sup>c</sup>	293 <sup>b</sup>	343 <sup>a</sup>	27.595	0.000	155	162	176	1.677	0.432

A review of the available literature revealed mixed results regarding WFH in relation to commuting distance. Studies from the US and Finland show that individuals with a longer commute time reported a higher desired proportion of WFH [63,64]. Some other studies reported no statistically significant differences regarding WFH in relation to commuting distance [65]. The study from the UK even found that a longer commute time was associated with a lower desire for WFH [66], which is in contrast with results presented in Table 5. These large differences between studies could be, at least in part, explained by mode of transport, as commuting by train on longer distances sometimes allows efficient teleworking [67]. On the other hand, in Slovenia, population density is relatively low, commuting is mainly by car and suburban busses, and trains do not offer the possibility of teleworking.

The impact of the COVID-19 pandemic on transport, and particularly on daily commuting, has been enormous, and some changes are likely to be maintained in the future. A large global survey conducted by experts [15] showed that nearly 80% of respondents believe that WFH will become popular, and over 30% even believe that online education will become a standard model of education. In a relatively short time, lessons learned from

the COVID-19 pandemic will lead to significant changes in transportation (66% agree and 12% disagree), which will contribute to better sustainability (60% agree and 15% disagree). A survey among university students in Seville [68] showed that those who are walking or cycling and live relatively close to the university are the ones most satisfied with their mode of transport, while for others, the speed of transport is the most important factor. Commuting distance is undoubtedly an important factor in terms of future attitude toward WFH [69]. However, studies show that, during WFH, non-work travel appears to be largely increasing, possibly even leading to less sustainable practices compared to office-based work [70,71].

#### 4. Focus Points

The University of Ljubljana is the largest public university in Slovenia with about 40,000 students and 6000 employees. It is among the top 3% of universities in the world (it is listed as one of the top 600 universities in the world, according to the Academic Ranking of World Universities). The university has 23 faculties of humanities, social sciences, linguistics, medicine, natural sciences, and technology and three academies of art. Because of the relative heterogeneity covering different academic and scientific fields, the results of the current study are less likely to be biased compared to the results obtained from some other surveys that included students and educators from a specific academic field.

In this study, we analyzed the attitude of students and university employees toward WFH. Our aim was to obtain the insight into the importance of particular parameters related to organizational, efficiency, social, or personal aspects of WFH among specific groups. We were searching for similarities and differences between those involved in the educational process (students and educators) and among university employees (educators, researchers, and others).

The responses of students and educators were also compared in terms of their attitude toward online education. The goal was to determine which segments of online education are perceived as more appropriate, and what is the suggested percentage of future online education activities, reported by each of two groups. Such information is also relevant in the trans-institutional view and will support current activities for development and use of digital tools and content, for example in the FEEDtheMIND Erasmus+ project. Gender, age, financial status, and commute time were identified in previous studies as important factors related to WFH and online education. Additionally, we wanted to find out whether there exist statistically significant differences in terms of gender, age, financial status, and commute time, with respect to any of particular parameters. The results of surveys like this one are important for future planning and optimization of WFH and online education.

##### 4.1. Work from Home: Employees' and Students' Perspective

The analysis of the results presented in Sections 3.1 and 3.2 points to some commonly perceived advantages, but also many disadvantages, of WFH. Except for the influence of WFH on eating habits, for all other parameters there is a statistically significant difference between some groups.

Students stand out as the group exposed to the highest stress levels compared to the other groups. They are also among those who devote more time to work but are the least efficient. On the other hand, students perceive WFH as the most beneficial in terms of financial benefit and elimination of commuting. Thus, parameters that are not directly related to the quality of the educational process (financial situation, commute time) are in favor of WFH, while lower efficiency and higher stress levels are the main disadvantages. Such results clearly point to the risk of marketization of education, where financial benefit might prevail over the quality of education. Any increase in the future online educational activities should therefore be carefully evaluated to prevent the students' belief that the degree is more important than the knowledge.

When all the analyzed groups are compared in terms of their attitude toward WFH, employees who are not involved in teaching or research (others) relatively benefit the most of WFH. They are the only group where the percentage of those who reported being more efficient is higher compared to those who are less efficient. Since on average their stress levels and workload have not increased, and they are more rested and physically active, there is clear evidence of the benefits of WFH. Especially for administrators, WFH could be a viable alternative, but the actual efficiency should be assessed objectively (not as self-reported efficiency), which was not done in this study.

#### *4.2. Online Education: Students' and Educators' Perspective*

The type of lectures, online or traditional, does not affect student attendance of lectures. Students consider online lectures to be a viable alternative to traditional lectures and suggest that nearly 40% of future educational activities could be performed online. However, there is also a strong awareness among students that online activities are inferior to traditional ones when parameters such as laboratory work, student–educator interaction, knowledge acquisition, and knowledge assessment are considered.

Generally, there are statistically significant differences between the two groups observed for most parameters, as educators find online activities relatively less suitable than students and suggest that a lower percentage of online activities should be retained in the future. Nevertheless, one third of educators find online lectures to be a viable substitute for traditional lectures. This is relatively high proportion, considering that the COVID-19 pandemic period is the first experience with online education for the vast majority of educators at the University of Ljubljana. So-called blended learning will most likely become a reality in the future, but laboratory and field work developing different skills and competences (evaluation, analysis, creativity, and working with others) should undoubtedly include physical human-to-human interaction.

#### *4.3. Online Education in Socio-Demographic and Socio-Economic Perspective*

The results of the statistical analysis show that women in both groups (students and educators) report higher levels of efficiency compared to men, and female educators devote more time to work. Literature reports on this topic often provide contrary results, and a higher burden of housework and childcare often contributes to lower efficiency of women in WFH. We did not include the question about the number of family members and children in the survey, which would allow us to assess the importance of this parameter in relation to women's efficiency in WFH, which is undoubtedly a weakness of the current study.

The reason why women in our study report higher efficiency might be related to the role of women in Slovenian society. After World War II, Slovenia was a socialist country, where the socialist regime in the 1940s already proclaimed women's emancipation. Even today, Slovenia is ranked as third among OECD members (after Iceland and Sweden) in terms of the percentage of women employed. Slovenia is also one of the European Union countries with the lowest (fifth place) pay gap between men and women. Future analyzes of gender issues related to WFH should undoubtedly consider the general social position of women, in the society in which the studies are conducted.

There are no statistically significant differences in the acceptance of various parameters of WFH and online education among educators of four different age groups. This result is somehow contradictory to some previous findings that older generations often express more disadvantages of WFH, mainly related to the lack of knowledge about new technologies. Nevertheless, educators at the University of Ljubljana are on average more familiar with information technologies than the general population, and it is also expected that the gap in this issue between older and younger generations will narrow in the future. That might lead to WFH being more accepted by the older ones, as they might have a better working environment at home with less distraction from other family members.

Our results point to the problem of online education for the first-year students who are statistically less satisfied with online lectures compared to the older students. In the future, if the proportion of online activities increases and blended learning becomes a regular practice, special attention should be paid to first-year students to properly introduce them to the university educational process.

The finding that financial status, with the exception of change in eating habits, is not a statistically significant factor in relation to various parameters of WFH and online education reported by students is possibly biased by the fact that students in Slovenia do not have to pay tuition fees. Usually, tuition is lower for online courses, which may be an important factor for students from other countries where fees are a significant part of the cost of post-secondary education. Other financial expenses, related to renting and transportation, are also reduced by online education, and the preference for online lectures may depend on potential government subsidies, which can vary widely from country to country. Further research on students' acceptance of online education should undoubtedly consider how the financial burden of education is co-financed by the government.

In contrast to financial situation, which was not a relevant factor in terms of acceptance of online education and WFH, the change in students' financial situation was a statistically significant factor for basically all the parameters. Students with an improved financial situation generally rated online education and WFH higher compared to those with worsened financial situation. Such results clearly illustrate how financial advantage might prevail over quality of education if financial gains are the primary driver in deciding which type of education should be pursued. In contrast, among educators, work efficiency was the only parameter that is rated significantly lower by those with a worsened financial situation. The reason for the observed difference among responses of the two groups could be attributed to the greater responsibility of educators for the actual quality of the educational process.

#### *4.4. Online Education and Commute Time*

Commute time was the only factor where statistically significant differences in acceptance of all parameters related to WFH and online education were found among students. Those students with the longest commute time (more than 90 min) rate all parameters significantly higher compared to those commuting for less than 30 min. It was previously found that on average, students who commute longer come to the university less frequently, but stay there longer [72]. It is possible that the blended learning system could be organized, whereas students are present at the university only on certain days, which would be very beneficial for those with longer commute times and would also lead to more sustainable practice, especially if they commute daily by private car.

There is a clear difference in attitude toward online education between students and educators. Educators' acceptance of online lectures was not influenced by commute time, indicating a high level of commitment to the quality of the educational process, as this parameter cannot be objectively influenced by commute time. For future studies about the acceptance of online education it is important to include both students and educators, as students' perceptions are more influenced by factors such as lower costs and lack of commuting, which alone do not contribute to higher quality of the educational process.

## **5. Conclusions**

Students and employees at the University of Ljubljana see the lack of commuting, improved eating habits, and more time that can be devoted to family members as the main benefits of WFH. On the other hand, their working environment at home is less suitable, efficiency is lower, and stress levels are higher when WFH is practiced.

When looking at a specific group, students are significantly more satisfied with WFH compared to other groups, because they do not have to commute, have a relatively better home working environment, can spend more time studying, and have greater financial advantage, but also have the highest stress levels. Educators find the lack of commuting

the least beneficial and are significantly the most eager to establish the pre-COVID-19 system. Other employees report that their working environment at home is the least convenient and they devote relatively less time to work, have lower stress levels, and are the most physically active.

Students and educators agree that online laboratory exercises, inadequate social interactions, and knowledge assessment are the biggest drawbacks of online education, whereas online lectures are especially for students a viable replacement to on-site lectures. Students in comparison to educators also suggest that a greater proportion of online educational activities should be maintained in the future.

Female students and educators report statistically higher efficiency at studying or working from home compared to their male counterparts. Female educators also spend more time working, while female students report significantly higher levels of physical activity. Educators' age was not a statistically significant factor in relation to WFH and online education, while for students, online lectures were less appealing to first-year students compared to their older colleagues. Change in financial situation during the COVID-19 pandemic is a more important factor in relation to the acceptance of WFH and online education in comparison to the general financial situation. Students with improved financial situation generally report significantly better perception of studying from home and online education compared to students with a worsened situation. Among educators, only those with worsened situations report lower efficiency at WFH.

Commute time is the most important of all the factors analyzed in relation to the adoption of WFH and online education for both students and educators. Students with a daily commute time of more than 90 min rate all parameters of studying from home and online education significantly more highly compared to those with a commute time of less than 30 min. For educators, the same trend is observed with respect to WFH, while commute time does not affect their acceptance of online education.

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**Conflicts of Interest:** The authors declare no conflict of interest.

## Appendix A

Web-based questionnaire survey: Attitude towards work from home (WFH) and online education during COVID-19 pandemic among students and employees of the University of Ljubljana

### *Section 1: Socio-demographic and economic status*

1. Gender:
  - Female
  - Male
2. University where I study/work:

- University of Ljubljana
  - University of Maribor
  - University of Primorska
  - University of Nova Gorica
  - University of Novo mesto
  - New University
  - Independent higher education institutions
3. Status at the University:
- Student
  - Educator
  - Researcher/Doctoral student
  - Other
4. Year of birth:
- \_\_\_\_\_
5. My daily commute time:
- Less than 15 min
  - 15 – 30 min
  - 30 – 60 min
  - 60 – 90 min
  - 90 – 120 min
  - More than 2 h
6. My financial situation is:
- Below average
  - Average
  - Above average
7. My financial situation because of the COVID-19 pandemic:
- Has worsened
  - Has improved
  - Did not change

*Section 2: Organizational, efficiency, social and personal aspects of WFH*

8. Study/work mode during COVID-19 pandemic:
- I study/work from home everyday
  - I study/work at university once a week
  - I study/work at university thrice a week
  - I study/work at university everyday
  - I am temporarily laid off
9. Organizational and efficiency aspects of WFH (mark your answer):

	Agree	Disagree	Neutral
Lack of commuting is beneficial	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My home working environment is better	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
More time can be devoted to study/work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am more efficient at study/work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My stress levels are lower	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I wish that pre-COVID-19 study/work mode is established as soon as possible	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

10. Social and personal aspects of WFH (mark your answer):

	Agree	Disagree	Neutral
WFH is a financial advantage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My eating habits improved	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

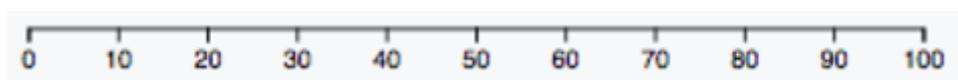
More time can be devoted to family	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
More time can be devoted to friends	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My physical activity levels increased	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am more rested	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### Section 3: Attitude towards online education

11. Comparison between online and traditional educational process (mark your answer):

	Agree	Disagree	Neutral
My online lecture attendance is higher compared to traditional lecture attendance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Online lectures can efficiently replace traditional lectures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Online laboratory exercises can efficiently replace traditional laboratory exercises	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Acquiring/dissemination of knowledge during online education is more efficient	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Interaction between students and educators during online education is better	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Online mode of knowledge assessment is more appropriate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

12. I would like \_\_\_% of online educational activities to be maintained in the future (mark on scale):



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