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Engagement In Technical Student-Run Organizations: How Do This Effect The Students' Well-Being And What Does It Mean To The Future Of Education?

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Engagement in technical student-run organizations: How do this effect the students' well-being and what does it mean to the future of education?

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ABSTRACT

Loneliness among Norwegian students has never been higher than after the Covid-19 pandemic (Lervåg et al. 2022). In recent surveys, over 50% of Norwegian students report they felt troubled by loneliness (Lervåg 2022, Tekna 2022). One article written by a student representative implies that loneliness may be counteracted if engineering students participate in student organizations, and that the universities needs to facilitate for that (Nitschke 2022). Engineering students worldwide engage in student-run organizations (SRO) where they design, develop, and build technical solutions (Li et al. 2023, Dol 2016). At the Norwegian University of Science and Technology (NTNU) those student organizations are referred to as *technical student-run organizations* (TSRO). This study investigates what it means to be a part of a TSRO. The following three questions are asked: 1) How does it affect the students experienced well-being? 2) How does it shape their views on education? 3) What do they think are the benefits from participating

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in a TSRO? This study makes use of in-depth interviews, think-out-loud protocols, and the UCLA loneliness scale. Eleven engineering students from NTNU have been respondents for this study. They are all associated with different TSROs at NTNU. This study might give new insight to important factors of the student well-being after the COVID-19 pandemic, and how the COVID-19 pandemic has impacted our students' psychological conditions. Is there a potential in the TSROs that has not yet been unleashed?

1 INTRODUCTION

1.1 Loneliness amongst students – a worldwide problem

New surveys[2] show that loneliness among full-time students in Norway has never been higher. As many as 60% of students who attend their first years of studies have at times felt lonely (Lervåg et al., 2022). In a second survey[3], the percentage of engineering students feeling lonely is reduced to 51%, and therefore less than the national numbers (Tekna 2021). 53% of the engineering students from the second survey said they were part of a volunteering organization, which could include student-run organizations (SRO). From these surveys, it is implied engineering students are experiencing being less lonely than students from other study programs, and does they engagement in a volunteer organization impact this?

Loneliness is a complex and multifaceted emotional state that arises from a perceived deficiency in social relationships. It is often characterized by a sense of isolation, a lack of companionship, and a feeling of being disconnected from others. Research has shown that loneliness can have significant negative effects on physical and mental health. As such, it is important to recognize and address loneliness as a public health concern and to develop initiatives that can help individuals build social connections and maintain meaning. Students especially stand out as one of the loneliest groups in the society in the post COVID-19 surveys.

Today's national measures of handling the increasing number of lonely students are similar to global approaches. Measures today include student counselling, psychological services, social events, online discussion groups and the establishment of student canteens and meeting rooms (Sivertsen et al. 2021). However, there is still a need to continue working on finding good solutions to support students' well-being and social needs, especially considering the increasing loneliness among students (Hysing et al. 2020; Sivertsen 2022). Several surveys from 2021 have increasing numbers of students feeling lonely between the years of 2018-2021 (Sivertsen et al. 2022). The COVID-19 pandemic was a challenge for many of the local initiatives at campuses in Norway. Many of the universities and colleges have problems in terms of 1) less student attendance in physical lectures 2) less students chose to spend time on university campus, and 3) the

[2] Out of 169.527 Norwegian full-time students, 59.544 students replied to the survey. The survey was conducted between 6th of February to 19th of April 2022 by Norwegian Institute of Public Health.

[3] The union Tekna (Engineering students and engineers are members) have distributed surveys to the students in 2021 and 2022 about the students experienced well-fare. It was distributed to 14.000 engineering students with 10.480 responses.

SROs and the local university organizers are struggling with low attendance for events and low student recruitment for extracurricular activities (ECA).

A large percentage of students at NTNU engage in ECAs, and there are a total of 132 officially registered SROs across the three university campuses. Eighteen of these SROs primarily engage engineering students, and the activities revolve around engineering practices. These organizations call themselves technical student-run organizations (TSRO), but are other places referred to as student teams. There are also several ECA initiatives at NTNU initiated, facilitated and/or led by university employees. Engage - Centre for Engaged Education through Entrepreneurship[4] have six thousand students participating in ECA from mainly NTNU and Nord university every year. Such initiatives include Spark* NTNU[5], Boost Henne[6], workshops, competitions, and summer schools.

TSROs are mostly student-led and based on voluntary work. Most of the TSROs in Norway do not offer salaries or ECTS from the university, but nonetheless, students may choose to spend up to 60 hours each week working in their affiliated organization. A previous study (Sivertsen et al. 2023), describes what the students gain from innovation competences when participating in SROS. All the respondents had two to seven different positions over their study years in a range of SROs and had a lot of learning outcomes from their experience. Most of them joined with a motivation to make new friends.

Previous studies examine and summarizes the benefits of the jungle of ECA (Bartkus et al. 2012), and for this paper all ECAs, SROs and TSROs can be described as “out-of-class experiences” (Nelson et al. 2002). In terms of the TSROs, there has not yet been conducted a study on the effects on students experience in terms of well-being. Berg et al. mentions how first year engineering students have opportunities to engage themselves in these student organizations when entering higher education for the first time (Berg et al. 2022).

Based on the above, the following three research questions are asked in this paper: 1) How does it affect the students experienced well-being? 2) How does it shape their views on education? 3) What do they think are the benefits from participating in a TSRO?

2 METHOD

2.1 Research design

This study employs qualitative research methods since the research questions are asking “how”-questions to investigate the phenomenon in-depth (Yin 2015). Interviews with students in TSROs are deemed appropriate for the qualitative inquiry, and several

[4] Engage - Centre of Excellence in Entrepreneurship Education work to increase the number of students in Norway and around the world with entrepreneurial skills and the mindset to become change agents for the better. Located at NTNU and Nord university.

[5] Spark NTNU a free peer mentoring service for students with a business idea, or who want to be part of a start-up company.

[6] Boost Henne free events for students. The events helps to engage and motivate more female students to explore entrepreneurship and invest in their own ideas.

techniques are combined in the interviews. The in-depth-interviews with followed a semi structured protocol and make use of a think-out-loud protocol to facilitate the data collection process (Ericsson et al. 1998). The think-out-loud protocol includes the revised UCLA loneliness scale where respondents self-report current loneliness and emotional states (Russell et al. 1980). The think-out-loud protocol furthermore have some questions from the two surveys done by SSB and Tekna (Lervåg et al. 2022; Tekna 2022).

2.2 Participant selection and data collection

Eleven TSROs from the NTNU were selected for this study. There are in total 132 SROs or other ECA at NTNU, of which 18 are TSROs[7]. These 18 TSRO include students from around twenty study programs, making the TSRO teams multidisciplinary. The reason for researching TSROs is that in a recent study (Sivertsen et al. 2023), the students express a high degree of psychological ownership to their work in the TSROs, creativity, problem solving, communication skills and their domain is closer linked to their studies – which from a study program perspective can create opportunities for collaborations of some sort. One student from each of the eleven TSROs were invited for a qualitative interview. The interviews lasted from about one hour to more than two hours each. The interviews were audio recorded, and the author also took personal notes from the conversations and also documented observations.

2.3 Data analysis

The data analysis departed from a set of themes related to loneliness – based on the topics in the think-out-protocol – for a thematic analysis of the qualitative data. However, the data revealed unexpected insights into well-being rather than only loneliness as such. Therefore, an abductive analysis approach (cf. Sætre and Van de Ven 2021) was done, going back-and-forth between the data and concepts (loneliness, well-being, etc.) from the literature. Therefore, the content and structure of the analysis results were guided by the research data collected from recorded audio, written notes, and observations during the interviews.

2.4 Ethical considerations

The study with data collection, interview guide, research plan and data management are approved by Sikt[8] and ethical considerations are being taken. The data will be anonymous. This data is considered health information and is therefore even more important to not disclose the respondents' identities.

3 RESULTS

3.1 Initial findings

The respondents have all participated in a TSRO from 7,5 months up to almost three years and are currently active members. They come from different places in Norway

[7] The 18 TSROs are Cogito NTNU, DNV GL Fuel Fighter, Hackerspace NTNU, Ingeniører Uten Grenser, Makerspace Gjøvik, Start Gjøvik, Orbit NTNU, Start NTNU, Start Ålesund, Propulse NTNU, Programvareverkstedet (PVV), Shift Hyperloop, Omega verksted, Vortex NTNU, Revolve - Formula Student, Ascend - NTNU's team in the International Aerial Robotics Competition, Spark NTNU.

[8] At Norwegian Agency for Shared Services in Education and Research the Norwegian Centre for Research Data is located. They approve research projects in terms of ethics, data management plans and important factors for the individual study.

and chose NTNU for various reasons. Most of them because their father or siblings have studied at NTNU, and all the respondents mentioned that NTNU is well-known for an active and social student atmosphere with many activities. Only one student had his sights for a particular TSRO, he later joined, already 3 years before he started his studies. It seems to be more common for the students to pick the student organization based on random factors such as 1) what day the TSRO had recruitment stands on campus 2) which students the respondents met during the initial few weeks in the start of a degree and 3) what organizations those new acquaintances picked. What organizations they become a part of shape their identity. They wear clothing with logos from the TSRO when they go to lectures and hang out at campus. They also identify as “one of us” and have a perception of what "the other" is like. The respondents do not at present time self-estimate that they are lonely – overall the results from the interviews, think-out-loud protocol and the UCLA sheet gives the impression the students are overall quite “unlonely”. This group of respondents are far away from the national loneliness numbers amongst students. In fact, the students rate themselves as less lonely than the national average by far. When we talk about loneliness, the respondents’ express worries that hasn’t happened yet.

3.2 Becoming a student – scary and big auditoriums

Some of the respondents had a tough time becoming students. Because the respondents for this study are in their second and third year of studies, most lecturers were taught in digital platforms because of the COVID-19 pandemic. The respondents did not make many friends in the first semester of studies, and they did not feel like they knew other students well enough to call them “friends”. During the interviews the respondents often describe other students from their study program or TSRO as “acquaintances” and have a high threshold for calling relationships friends.

From an interview with a respondent (respondent A) that wasn’t a part of a student initiative her first study year, she described how she became passive during and after the Covid-19 pandemic, and how it affected her last year of high-school and first year of higher education. She didn’t feel like being active or taking part in anything. The responded studied full-time and had a part-time job, but felt lonely at the university campus:

"When it rained a lot, I struggled to get up and go to classes. Especially since I could follow along digitally and didn't know anyone else in the class."

The respondent, similar to all the respondents in this study, goes to lectures in big auditoriums with several hundred students and finds it scary if they don’t know any one there.

Since then, the respondent has become part of a TSRO, and have been so for almost a full year by the time of the interview. She will continue with this for at least another year. She is moving to a position with more responsibility. At the time she felt lonely at the start of her studies she often went home to her parents to stay and meet her at-the-time boyfriend. That made her feel better then. Now, she is not in any romantic relationship. Her result from the interviews indicates she is not at present time expressing feelings of loneliness. She is rather very happy and content with her current life situation, is invited

to parties and have two good friends she is living with that she tells is important to her. She spends a about 15 hours every week on her work in the TSRO, and around 30 hours studying.

3.3 Best friends – the best support

The respondent (respondent B) that scores to be *least l*onely from results using the UCLA scale, explains in his interview what he is most worried about. In general, he lives with, amongst others, his best friend from high school. He expresses that the best friend's role is extremely supportive. The two of them have regular activities together several days and evenings each week. When the respondent was filling in the UCLA sheet, he addressed the question "I do not feel alone" with saying:

"I am just worried in case my best friend gets a girlfriend. Then I might have to spend a lot of time by myself and get lonely".

His best friend is not a part of the TSRO. He spent around 25 hours every week at the location of the TSRO, and the weeks leading up to the interview he spent 45 hours at the TSRO. Sometimes he is there and does study related work, but most of the time he works in the TSRO and hang out with other members. In the fall he will take on more responsibilities and go from a team member to become a technical team leader.

3.4 Overworked – expectations across the board!

The respondents are struggling more with feeling of being overworked and have psychological effects of this. This applies the respondents who are in leader positions and have studies with a high degree of difficulty. Attempting to achieve high academic results and at the same time following up all students in the TSRO and all inquiries from collaborations and other stake holders takes a toll. The respondents describe how they actively distance themselves from the TSROs and often solve this by traveling home to family, and/or going to enjoy the outdoors. Some of the respondents share how they struggle to complete all their study courses in normal time and need to re-take their exams on a later point. They are most motivated to spend their time on activities that relates to results that effects the other students and stakeholders in the TSRO. Their own individual performance in their study is taking a backseat. It seems like not all students are have this problem, a few are skilled at time management and have good habits to get everything done in time and therefor have good academic results and perform well and spend a lot of time in the TSRO. It seems the good academic results are easier to achieve if the tasks in the TSRO are similar to their study program and transferable to the courses. There were no questions regarding academic results in the interview guide, but the students chose to talk about it in the interview setting.

3.5 It's not for everyone – because you might not get accepted

Being part of a particular SRO, or TSRO, is not always available for all students. The respondents are describing the recruitment processes, and how some of the organizations have demands particular prior experience, large work capacity, and expectations that the members need to spend 10, 15, 30, up to 60 hours each week over the coming year. A lot of students are declined in the process of recruitment for an

SRO that they are applying to. Some of the TSRO, nevertheless, have fewer applicants than others.

3.6 Building a social community

One of the TSROs launched their new “project” this spring. They had been working on it for seven months and 85 people were present at the event. Several of the students were up on stage presenting this. 53 students from 24 different study programs had been part in making this, and it had been over 25 000 working hours into the project. The student leader of the TSRO said this:

“It’s a place to be curious. It’s a lot of kind people and a place to make friendships. Our job is to connect likeminded students to challenge themselves and see what’s possible. There are often long days and sometimes problems. But always pun and jokes”.

During the event, the students looked proud and grouped together to take pictures with business partners, friends, and family next to the new “product”. Being part of a SRO enables the student to build connections with peers who share similar interests, and to engage in collaborative problem-solving and team-building activities.

The social aspect can be a trigger for the students and motivate them to spend time in the organization, some of them join to make new friends, and some of them realize after some time the social benefits. Several of them point out that working together in a team is a positive experience and being able to progress and make something much better than if they only did it themselves as a hobby. One of the students tells us about the difference between the TSRO work comparing it to his studies. He says that the study program has a lot of independent work, and they sometimes help each other out with assignments, but large teams of more than three students with a large organization with over 50 students working together is very different. This could be an interesting challenge to educators of engineering education - are we able to facilitate larger challenges or exercises for large groups?

4 CONCLUDING DISCUSSION

This study has investigated what it means to be a part of a TSRO, asking the following three questions: 1) How does it affect the students experienced well-being? 2) How does it shape their views on education? 3) What do they think are the benefits from participating in a TSRO? Although this study started out with a focus on well-being focusing on loneliness, the abductive research process shifted the focus over to well-being in a broader sense. To conclude, the respondents do not directly relate TSROs as factors for not being lonely. Therefore, it is in this study challenging to conclude anything about the TSROs role in reducing the respondents feeling of loneliness. For a later study, a research design that enables a control group of students that is not part of the TSRO but having a similar study program and background would be a way to try to measure this. However, this study pinpoints several ways in which TSROs relate to students’ well-being. For example, this study suggests that ECAs can have a positive impact on students' social connectedness and sense of belonging, which may help to reduce feelings of loneliness and isolation.

Several questions for further research emerge. For instance, the sometimes extensive work required from students in a TSRO may have negative consequences. What about the students that feel overworked and worst case, get a burnout? A focus on overwork and burnouts is one suggestion for further research. However, this study has also pinpointed that there are several benefits of involving in a TSRO, but many students may not be admitted into the organizations. Thus, another topic for further research that emerges from this study is how the benefits of ECAs in general, and TSROs in particular, may be scaled to reach and engage even more students. A third topic for further research is how students' engagement in ECAs may aid and even integrate with curricular teaching and learning. For instance, ECAs offer an arena where students get to know their peers, and perhaps may we as educators employ similar approaches to create a social community in our classrooms? Can a stronger social community motivate more students to attend curricular initiatives in-person?

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