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Better user involvement in complex building projects: The case of the NTNU Campus Development Project

Survey results

Trondheim, 13/12/2021



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Foreword

This report is a deliverable of the project “Bedre Brukermedvirkning” (i.e. “Better User involvement”), funded by “Fremtidens Campus” (i.e. “Campus of the Future”).

This project is a collaboration between NTNU’s Department of Mechanical and Industrial Engineering (IMP), the Department of Civil Engineering (IBM) and Environmental Engineering, the Department of Architecture and Planning (IAP), the Department of Social Anthropology, as well as the Norwegian Business School (BI). The project is led by Professor Bjørn Andersen at IMP.

“Fremtidens Campus” is a research and development program that will follow NTNU's work on campus development. It is funded by NTNU and coordinated by NTNU Social Research.

The report is based on a survey conducted in the summer 2021 among the Campus users in Trondheim, analyzed and authored by Professor Alenka Temeljotov Salaj, PhD candidates Coline Senior and Tausif A. Ishtiaque, Dr. Savis Gohari Krangsås, and Master student Emmanuel P. Azebeokhai. Thanks to Mahgol Afshari for good help during the process and Bjørn Adersen for the facilitation. Thanks also to associate professor Håkon Fyhn and Dr. Martin Loeng for their work on the facilitators’ perspective, and to professor Geir Hansen and associate professor Bassam Hussein for fruitful discussions and counselling along the way.

December 13, 2021,
Trondheim

Prof. Alenka Temeljotov Salaj

1 Introduction

This report is a deliverable of the pre-project “Bedre Brukermedvirkning” at NTNU. The project explores how facilitators and users in Norwegian construction projects believe that participation processes can and should be improved and developed in the future. In addition, this pre-project constitutes the starting point for a larger research project at NTNU.

The project was initiated to investigate general challenges related to user involvement in development projects, building upon specific experiences from the Campus Development Project and other Statsbygg projects, related to the involvement of broadly heterogeneous user groups in complex construction projects. The project aims to map experiences from the Campus Project and Statsbygg, and to identify the critical factors for successful user involvement processes and the way they are conducted. This mapping will then provide a basis for establishing a larger interdisciplinary research project on effective user involvement and contribute to a better involvement of NTNU’s heterogeneous user groups. The project is a collaboration between the Campus Development Project, Statsbygg, and researchers, PhD and master’s students from technical and social sciences faculties at NTNU, as well as BI Norwegian Business School.

This report presents the results of an online survey conducted between July and September 2021 among NTNU’s campus users in Trondheim. While the sampled population is considered to be statistically representative, some shortcomings related to the design of the survey as well as the data collection process were observed. The results should be carefully read in light of the possible shortcomings which will be clearly stated in the report.

The report is geared towards stakeholders engaged in the development of user involvement processes i.e., contractors, consultants, decision makers and users of the Campus as well as those who aspire to be engaged in the future. Results from this report can also be particularly valuable for actors outside the organization and non-experts in user involvement processes, in order to understand how these processes are perceived by users and what their expectations might be.

The NTNU Campus development project like other major construction projects, is challenged to map end-user requirements among a diverse and heterogeneous user-base expressing different needs and requirements. While intuition might suggest that greater complexity and heterogeneity may scale these challenges up and pose extensive problems, the problem does not necessarily lie with heterogeneity and complexity in users’ requirements. Heterogeneity and diversity among user groups may be associated with overwhelming complexity. Yet, the requirements management process in the construction industry works to locate opportunities for more solid comprehension of users’ needs in the construction industry. Heterogeneity and complexity, in other words, is achieved. Thus, responsible project management and requirements management, how projects plan, manage and frame the user participation processes to achieve and comprehensive understanding of user requirements, is the main focus of this project.

To address these challenges, Placemaking and PPS (Places, Placemaking movements and Systemic change) theories are taken into account in the design of the survey. Placemaking as the one to inspire people to collectively reimagine and reinvent public spaces as the heart of every community. The connection between people and the places they share, could be strengthened by a collaborative process that shapes a public realm in order to maximize shared value. To define a place and support

its ongoing evolution, it is important to engage users in transformation of urban design, facilitating creative patterns, by paying particular attention to the physical, cultural, and social identities.



How PPS drives the change by Project for Public Space
<https://www.pps.org>



Placemaking Theory by Project for Public Space

The placemaking theory as a collaborative process is to be used in the Campus Development project with the aim to:

- collectively reimagine and reinvent joint/public spaces as a heart of university community (UC stakeholders).
- strengthen the connection with end-users in order to maximize the shared value.
- facilitate creative patterns of use with particular attention to the physical, cultural, social, environmental, policy and other contextual identities that define a place and support its ongoing evolution.
- facilitate the reinventing of inner spaces changes (various types of rooms).
- engaging end-users through the entire process (time).

For this project, different categories of users have different priorities and needs in terms of involvement in the Campus development project. Users can be categorized either according to their position in the organization (e.g., students, scientific staff, administrative staff) or by considering their affiliation (e.g., Faculty, central administration, library). Results from this survey suggest that both categorizations can be relevant to observe as they reveal diverging perspectives on different aspects of the campus development project.

The report is structured as follows, first the method section describes the design of the questionnaire and the data collection process. Secondly, the results are presented and finally analysed and discussed in the discussion part.

2 Method

Design of the survey

The questionnaire was designed to address the following assumptions formulated by the pre-project “Bedre Brukermedvirkning”:

1. End users are a very **broad category** of stakeholders
2. There is a need for good **process requirements** for mapping, documentation, assessment, prioritization and tracking of end-user requirements
3. Process requirements also include the development of good **methods for involving end-users in decision-making processes** throughout the project
4. There is a need for good processes that **contribute to a better understanding of the complexity** of requirements among end-users (framework conditions, existing systems and infrastructures as well as other business matters)
5. There is a need to **ensure a better connection** between requirements, solutions and the effect of the solutions
6. There is a need for good **processes that improve** the client's, consultants' and the contractors' understanding of both the heterogeneity of the end-user's needs and possible limitations to articulate their needs

These assumptions were then theorized into the Placemaking Framework, and deeper into the PPS framework (Places, Placemaking movements and Systemic change). This resulted into the following structure for the questionnaire:

- I. Identification of stakeholders
- II. Identification of needs & problems/challenges of the participation process in the Campus development project
- III. Identification of process requirements for involvement in defining/evaluating space

Data collection process

The questionnaire was hosted on by Nettskjema in accordance with the NTNU guidelines on data collection. The questionnaire was fully anonym, required no login access and collected active consent of the respondents at the start. The questionnaire obtained NSD approval on 28.06.2021.

The link to the survey was posted online for the first time on 30.06.2021 on NTNU’s intranet “Innsida” on the “all employees” and “all students” channels. It was then relayed onto intern channels at the departments level as well as on the channel “Participants to research studies wanted”. The same process was repeated on 23.08.2021 to collect more responses at the start of the Fall semester. Both the intranet post and the survey itself were provided in Norwegian and in English. The survey was open and accessible for respondents for 61 days (30.06-30.08.2021).

Data analysis process

The survey was closed on 30.06.2021 and the results were exported from Nettskjema in an Excel format. Results from the Norwegian and English questionnaires were merged to form one dataset. Data mining and analysis were performed using Microsoft Power BI. This tool allowed for visualization of data and facilitated the exploration of possible interrelations between the different questions. All questions were collaboratively analyzed by a team of 4 researchers. This was done in two steps, first looking at the general answers (i.e., unsorted) to identify the overall trend. The second step consisted in going through the results and filtering them according to the respondents' status in the organization to identify significant differences that could be relevant to address in the analysis. At this stage, the three largest groups of respondents were identified as Scientific staff, Students and Administrative staff.

The results of the survey were presented in a meeting between the researchers and actors from the Campus Development project, including Statsbygg. The discussion that took place on this meeting led to a request to obtain additional results from specific questions clustered by respondents' status and affiliation. These results are also presented in this report.

3 Results

Introduction / Demographic

This section covers the composition of the sampled population in terms of user groups (e.g. administrative staff, students, ...) their affiliation to a Faculty, and whether or not they have been informed about the Campus Development project.

The following questions were asked under this section.

- Who are you?
- Have you been informed about the Campus Development Project?

➤ Who are you?

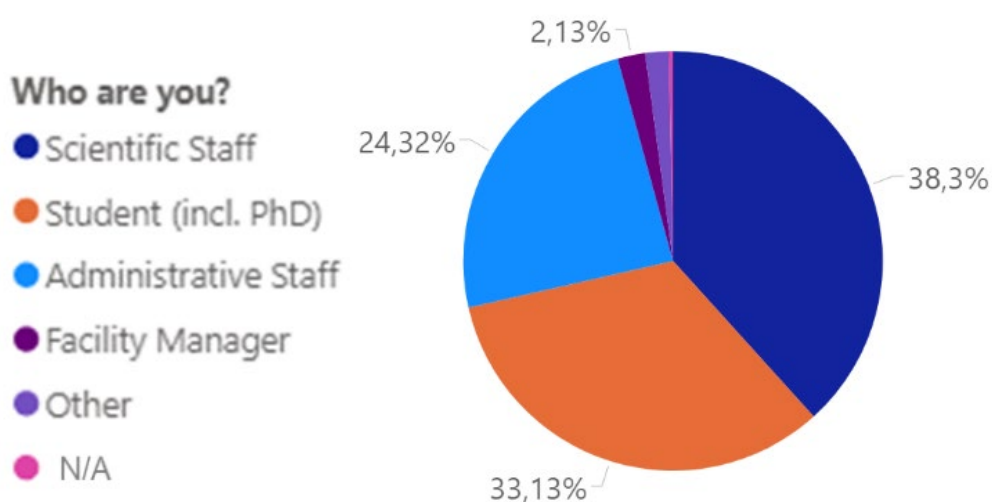


Figure 1 Repartition of the sampled population according to user groups

The total number of responses was three hundred and thirty-three (333), scientific staff represent the largest portion of the sampled population (38,3%). Additional answers were given in the open field

section: Technical staff, University Librarians, Real estate section staff, Central Administration staff, Division for Governance and Management Systems staff and TTO.

- Have you been informed about the Campus Development Project?

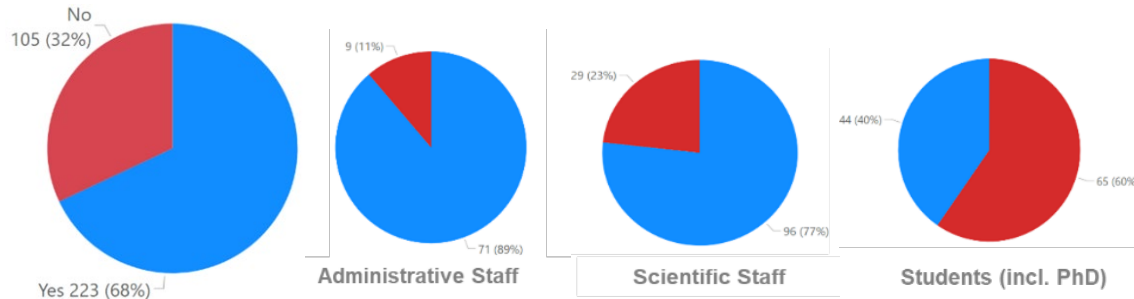


Figure 2. Have you been informed about the Campus Development Project? General results and according to different user groups.

68% of the sampled population declared that they have been informed about the campus development project.

89% of administrative staff and 96% of scientific staff, said they have been informed about the campus development project. However, students represent the least informed group with 60% of them declaring that they have not been informed about the campus development project.

Part 1 - Stakeholders and users

This section covers questions regarding communication, outreach, and collaboration. The following questions were asked under this section.

- How often do you interact with people from other faculties than the one you belong to?
- How have you been informed about the project?
- How actively did you look for information?

- How often do you interact with people from other faculties than the one you belong to?

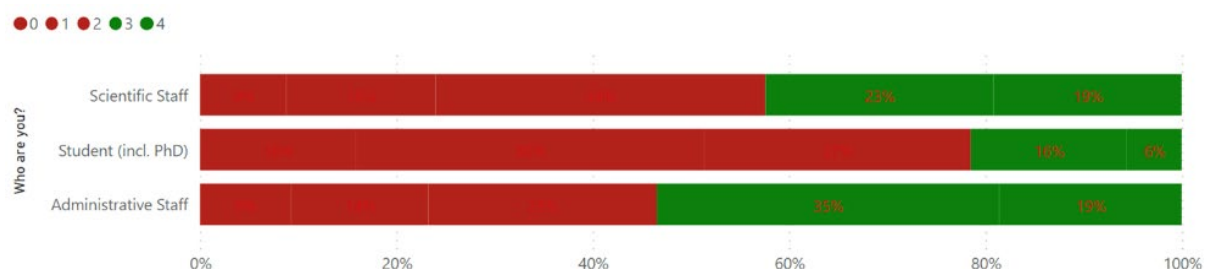


Figure 3 Frequency of interaction between faculties according to different user groups.

People generally declared to interact with other faculties somewhat often with administrative staff being the most interactive group, while students tend to have less interaction.

➤ How have you been informed about the project?

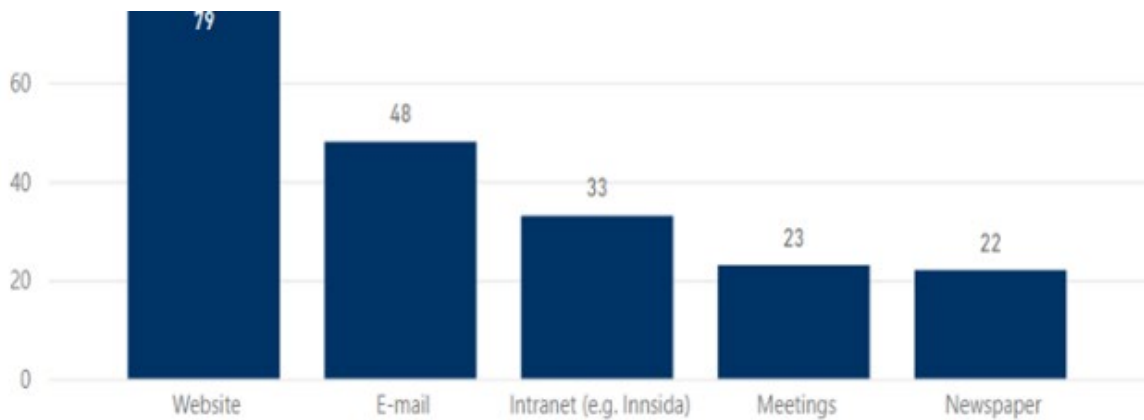


Figure 4 How have you been informed about the project?

79% of the sampled population were informed about the project through the website and the least communication channel was the newspaper. Additional communication channels provided by respondents include the university newspaper, Via manager/colleagues, Singaker velforening, this survey, and Via friends / personal contact.

➤ How actively did you look for information?

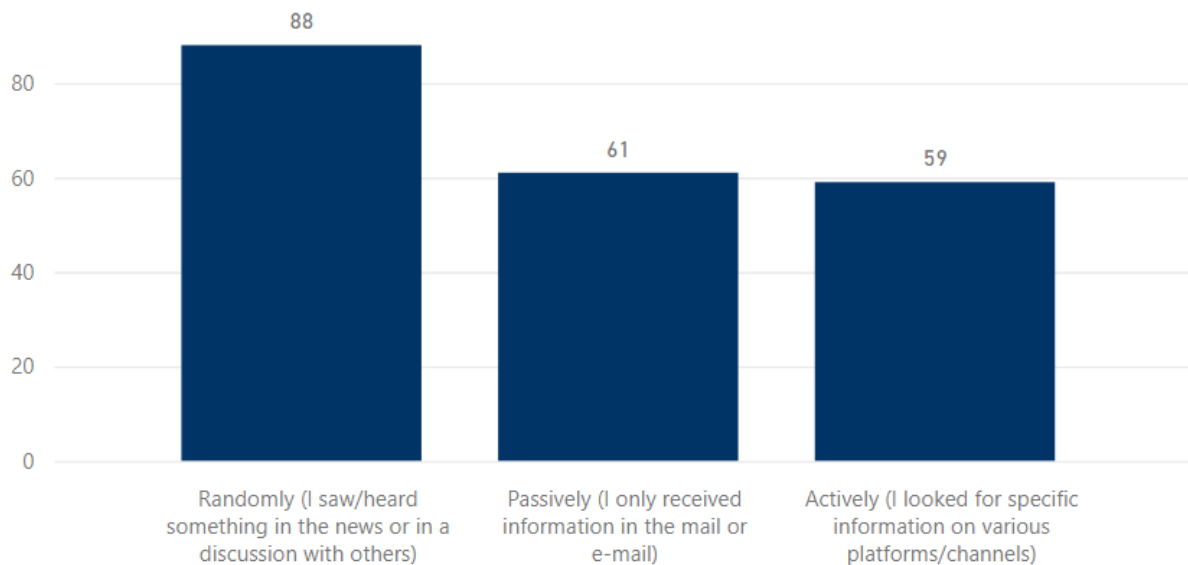


Figure 5 How actively did you look for information?

Overall, 88% of the sampled population randomly got information regarding the project, 61 % received information passively and 59% declared to have actively looked for information.

- Who are the three most important stakeholders to listen to in the campus development project?

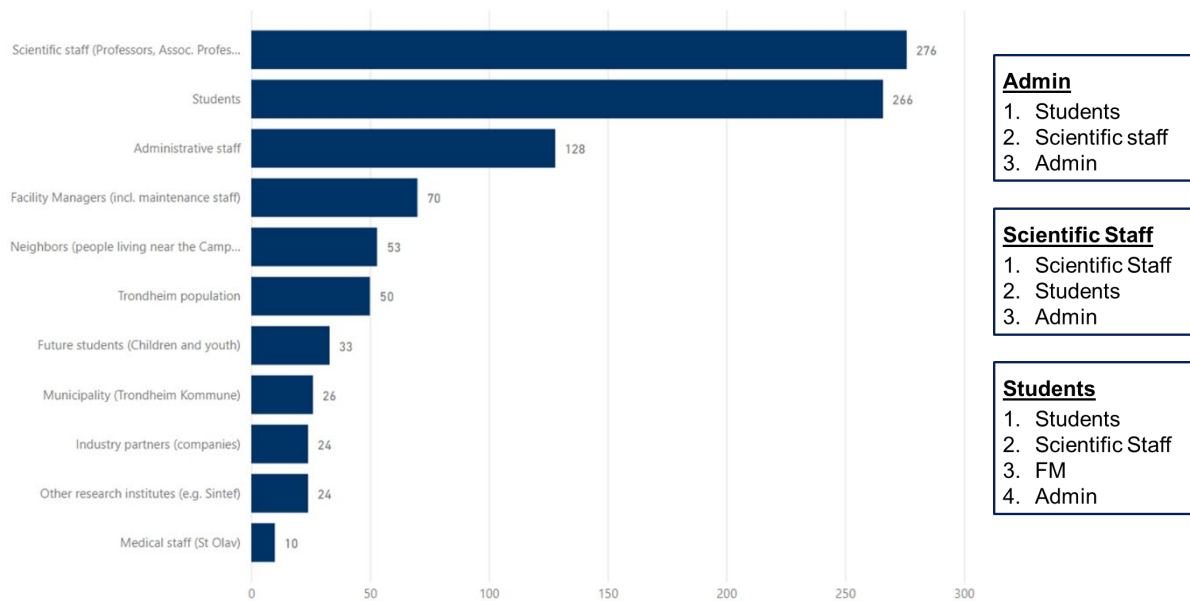


Figure 6 Ranking of the three most important stakeholders to listen to in the campus development project. General results and according to different user groups.

Scientific staff, students, and administrative staff are designated as the three most important stakeholders to listen to in the campus development project. The right-hand side shows the three most important groups selected according to administrative staff, scientific staff, and students.

Both Scientific staff and Students nominate themselves first, whereas administrative staff put students first. Additionally, students consider facility managers to be an equally if not more important group as administrative staff (with one vote difference).

Additional important stakeholders provided by the respondents include, technical staff, safety representative, disabled and disabled (individuals and organizations), more modern universities, LOSAM, independent construction professionals.

Part 2 - Needs, opportunities, and challenges of the participation process in the Campus project

This section addresses questions regarding the information, dissemination of the project, opportunities to participate, and degree of involvement.

The following questions were asked under this section.

- Users' perception of the process
 - Do you think you are an important stakeholder/participant in the project?
 - Do you think decision makers perceive you as an important stakeholder/participant in the project?
 - Do you think there has been enough opportunities for you to participate in the project?
 - In what degree is it most important for you to participate in the project?
 - How often would you be willing to give feedback on the project?
- Nature of the information received and topics of interest
 - What kind of information did you receive?
 - Which topics do you want to hear more about regarding the Campus Development project?

Users' perception of the process

- Do you think you are an important stakeholder/participant in the project?

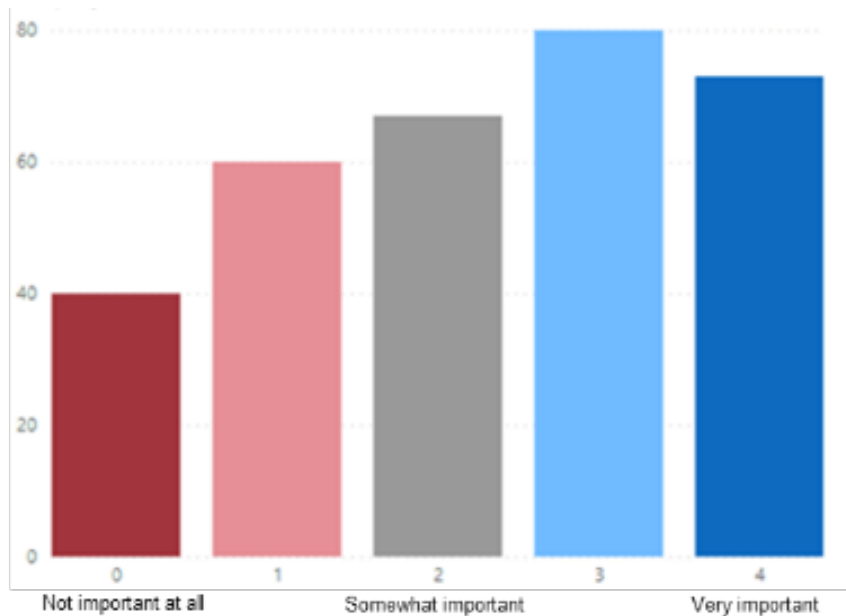


Figure 7 Users' perception of their importance as a stakeholder in the project.

To a large extent, a greater percentage of the sampled population perceive themselves as important stakeholders in the campus development project.

- Do you think decision makers perceive you as an important stakeholder/participant in the project?

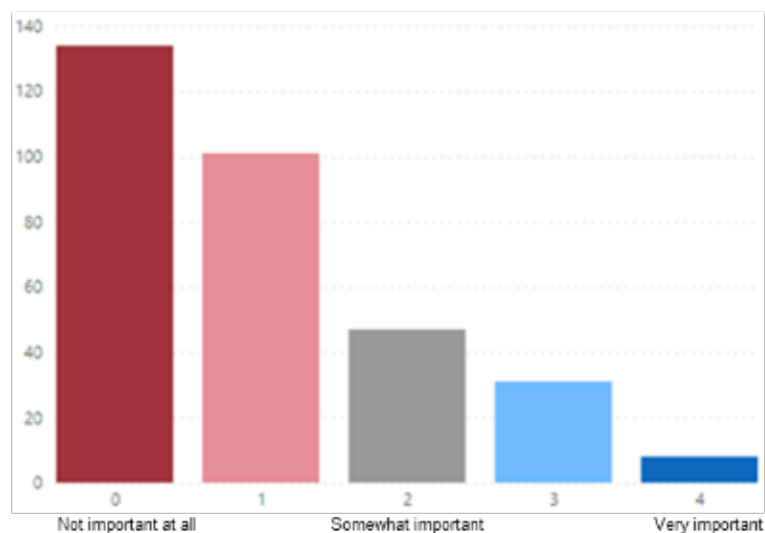


Figure 8 Users' views on the decision makers' perception of their importance as a stakeholder in the project.

Most respondents do not think that the decision makers perceive them as an important stakeholder/participant in campus development project.

- Do you think there has been enough opportunities for you to participate in the project?

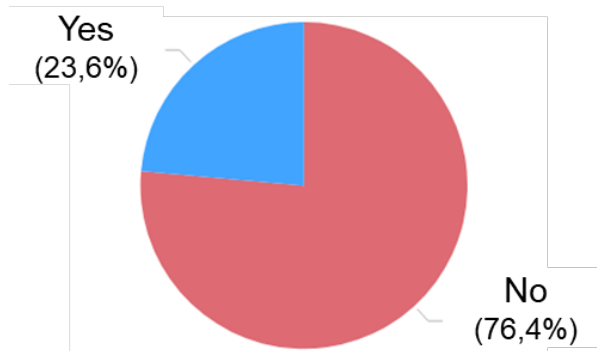


Figure 9 Users' perception of the available opportunities to participate in the project.

76.4% of the population size believe there has not been enough opportunities for them to participate in the campus development project.

- In what degree is it most important for you to participate in the project?

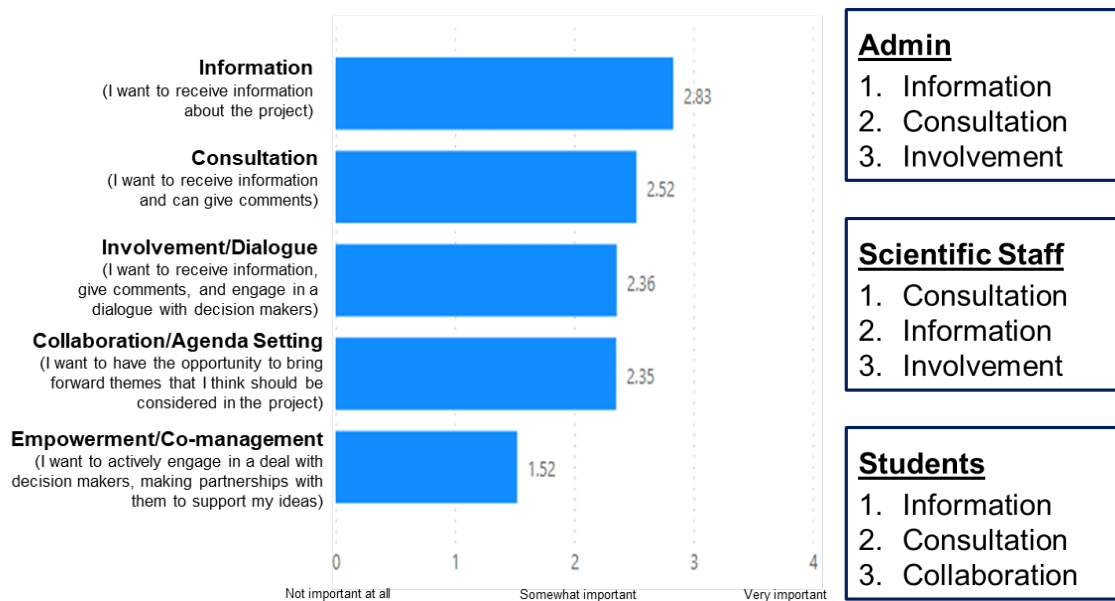


Figure 10. Users' rating of the participation levels (as defined by Arnstein (1969) and Ringholm et al. (2018)). General results and ranking according to different user groups.

Administrative staff and Students put *Information* first, while scientific staff put *Consultation* first. Consultation is equally important to the admin and students. However, only students rank *Collaboration* higher than *Involvement*.

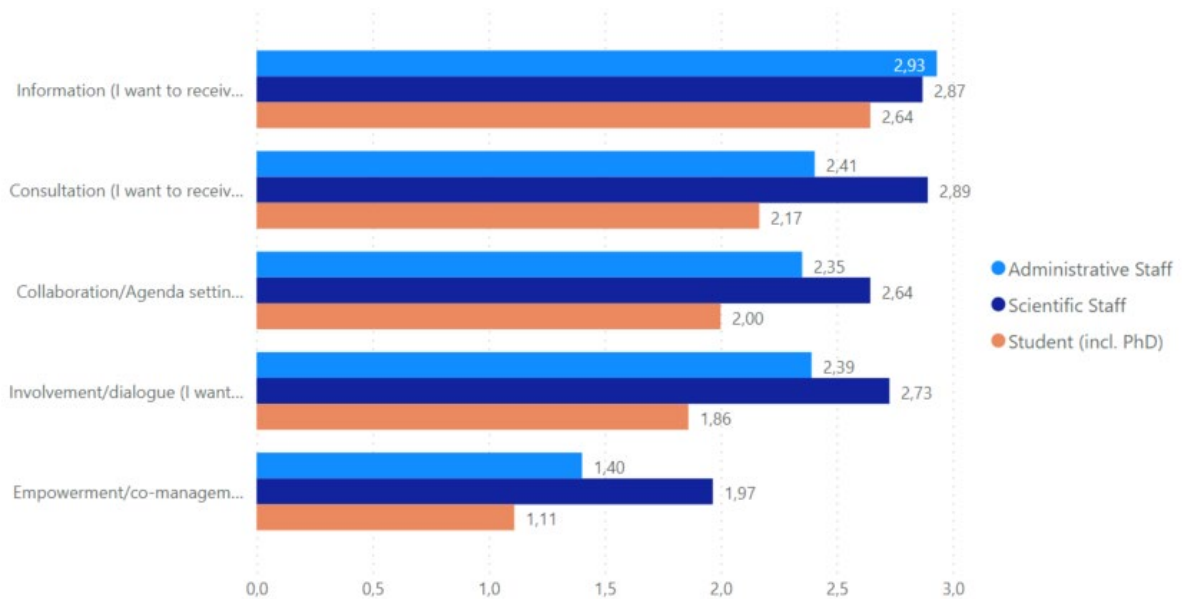


Figure 11 Rating of participation degrees according to Administrative staff, Scientific staff, and Students (incl. PhD).

Generally, respondents are mostly concerned about receiving information about the project. Consultation, Involvement, and Collaboration also appear to be somewhat important while Empowerment is scoring the lowest.

When looking at the answers according to different user groups, the scientific staff appears to emphasize more the importance of all 5 levels of participation compared to the overall population. On the contrary, students rate all levels of lesser importance compared to the overall population.

➤ How often would you be willing to give feedback on the project?

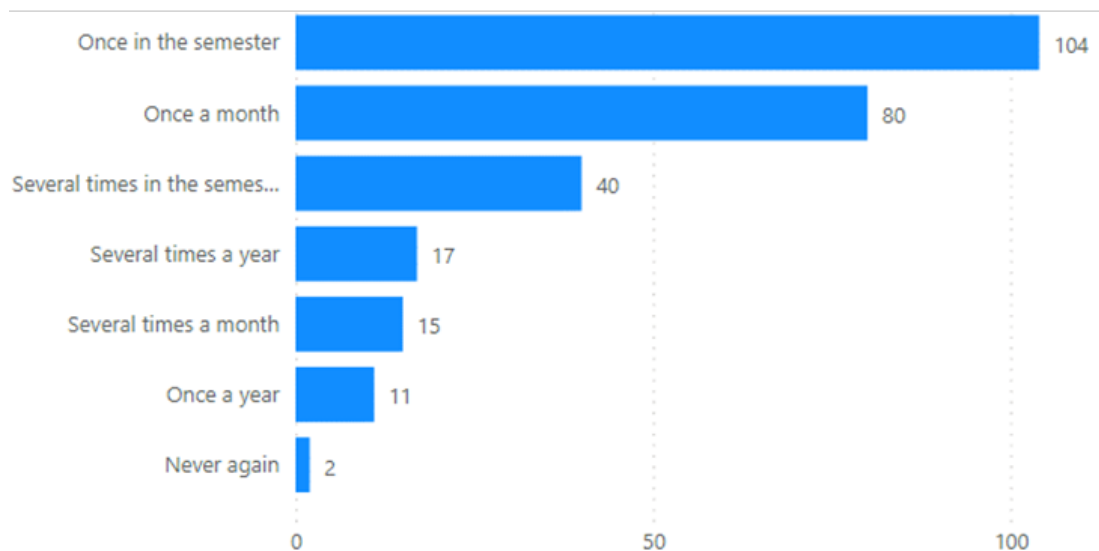


Figure 12. Users' willingness to give feedback on the project in terms of frequency.

Most people are only willing to give feedback once in the semester or once a month. While a small portion is also willing to give feedback as often as several times in the semester.

Nature of the information received and topics of interest

- What kind of information did you receive?

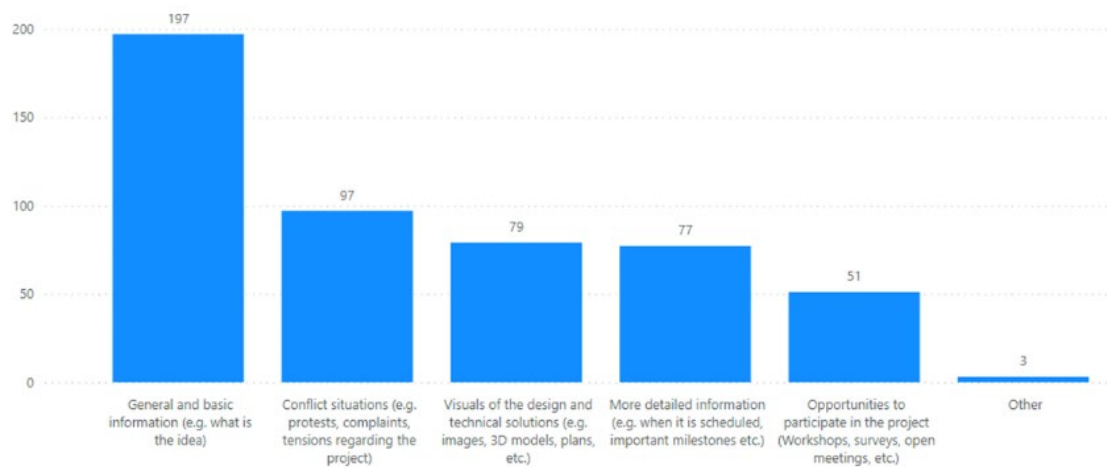


Figure 13. Nature of the project's information received by users.

General and basic information about the project are the ones that most people received. In addition, people also received information about conflict situations, design, and detailed information about the project. A smaller percentage only received information on the opportunity to participate in the project.

- Which topics do you want to hear more about regarding the Campus Development project?

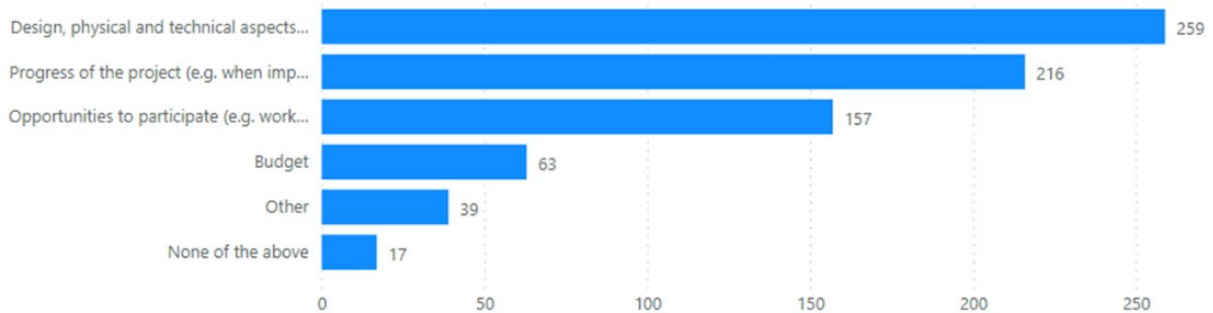


Figure 14. Users' preferred topics of interest.

The highest interest of people is in the design, physical and technical aspects of the project. More so, a sizable portion of the population want to hear about the progress of the project, and the opportunity to participate. Only a few are interested in the project budget.

Additional suggestions received from respondent includes possibilities to influence the project, Design/Location of the spaces (built environment), consequences of the project (e.g. on work environment), sustainable aspects of the project, project's contribution to improve education, participation in the project (e.g. timeline, details, decision making).

Part 3 - Process requirements for involvement in defining/evaluating space.

This part contains questions regarding the design of the rooms/space and participation process' requirements/expectations.

The following questions were asked under this section:

- Rooms and areas of interest
 - Which indoor areas would you like to give input to?
 - Which outdoor areas would you like to give input to?
- Users' motivations to be on campus
- Users' willingness to contribute to the project
 - Based on your scientific/professional background, what would you like to help with in the project?
 - If a new project started now, in which phase would you like to participate?
- Users' perception of the project focus
 - Which topics has the project focused the most on until today?
- Users' wish for the future
 - Moving forward, which topics should the campus development project focus the most on?

Rooms and areas of interest

This section collects respondents' input on which indoor and outdoor areas they are willing to give input to.

➤ Which indoor areas would you like to give input to?

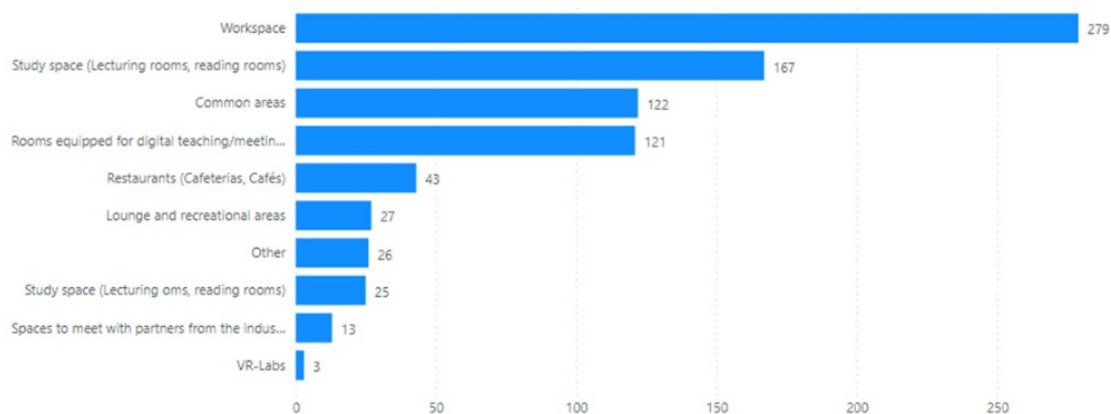


Figure 15 Indoor areas that users would be willing to give input to in number of responses.

Users are more willing to contribute to the workspace. It is followed by Study space. Common areas and digitally equipped rooms are also designated as potential areas to give input to. However, VR-Labs are of less interest to users.

Additional suggestions received from respondents for indoor areas includes, Laboratories, Museum storage space, Libraries, meeting places for employees, premises for student volunteering, Meeting rooms and conference areas.

Overall laboratories, museum and libraries had the highest interest of users for the additional indoor areas.

- Which outdoor areas would you like to give input to?

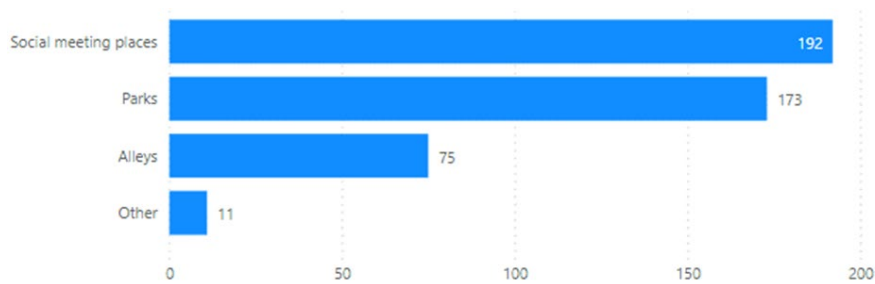


Figure 16 Outdoor areas that users would be willing to give input to in number of responses.

Generally, people are mostly interested in giving input to social meeting places and parks.

Additional suggestions received from respondents for outdoor areas include, pathways system (incl. indoor / covered paths), bicycle access, parking (car and bicycle), playgrounds, public accessibility, Integration with the city.

Users' motivations to be on campus

- How much time do you typically spend on campus for these activities?
I come to the Campus to...

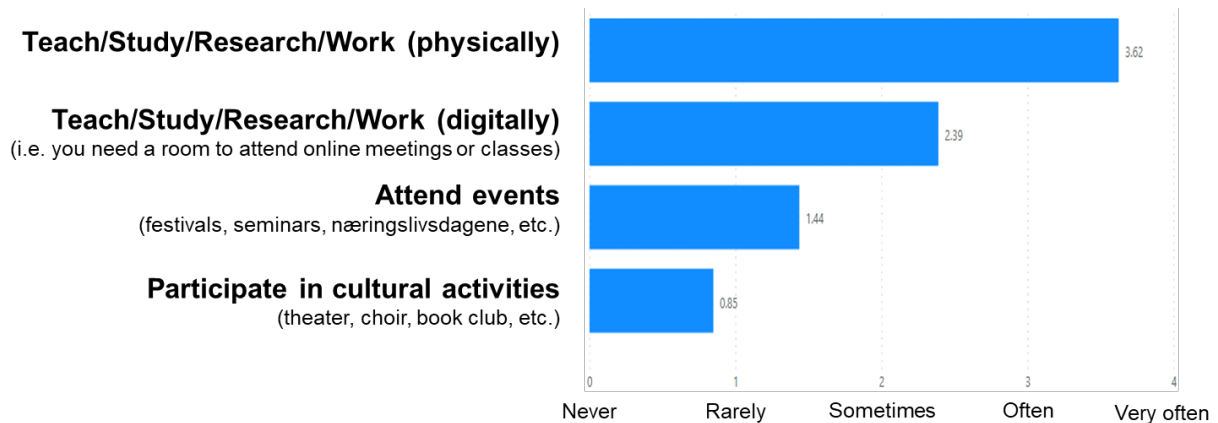


Figure 17. Users' motivation to come to the campus.

Most respondents come to Campus to teach, study, and conduct research work. However, some are motivated to be on campus because they need a space to conduct these activities digitally (i.e. they need a room to attend online meetings or classes). Events and Cultural activities are less significant motivation factors to come to the Campus.

Users' willingness to contribute to the project

- Based on your scientific/professional background, what would you like to help with in the project?

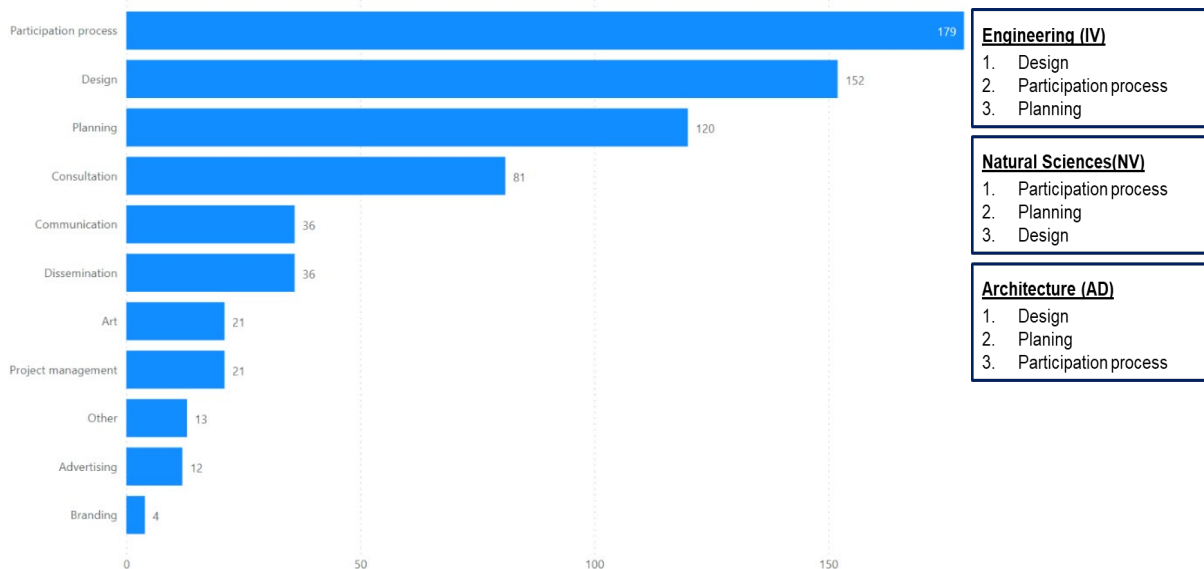


Figure 18 Users' interest to participate in the project based on their scientific/professional background.

Participation process, design, and planning are endorsed as the three top areas of interest for respondents to help with. While the faculty of engineering, architecture and design selects design as the top area in the project they are willing to provide help. The faculty of architecture and design has the same vote for design and planning. However, advertising and branding are of less interest to people.

- If a new project started now, in which phase would you like to participate?

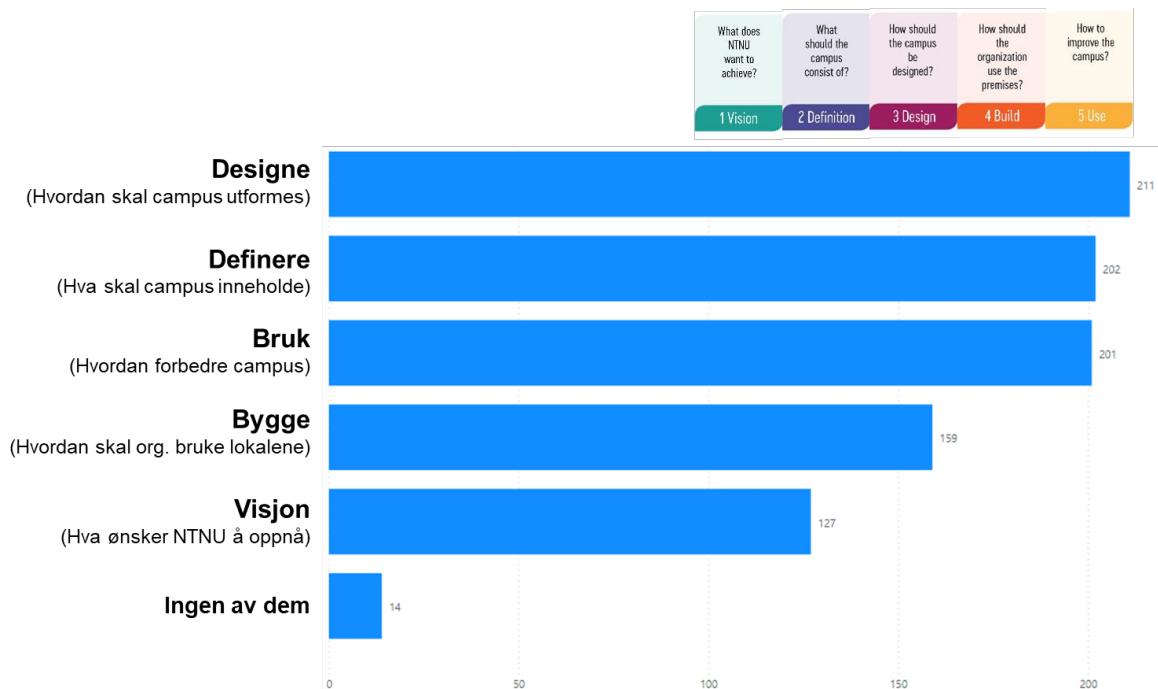


Figure 19. Phases of the Campus development project that respondents are most willing to participate in.

People are mostly willing to participate in the design, definition and use phases of the campus project. This expresses an interest among respondents to participate in designing the campus, defining what it should contain, and how to improve the campus. However, some respondents have no interest in participating at all.

Users' perception of the project focus

- Which topics has the project focused the most on until today?

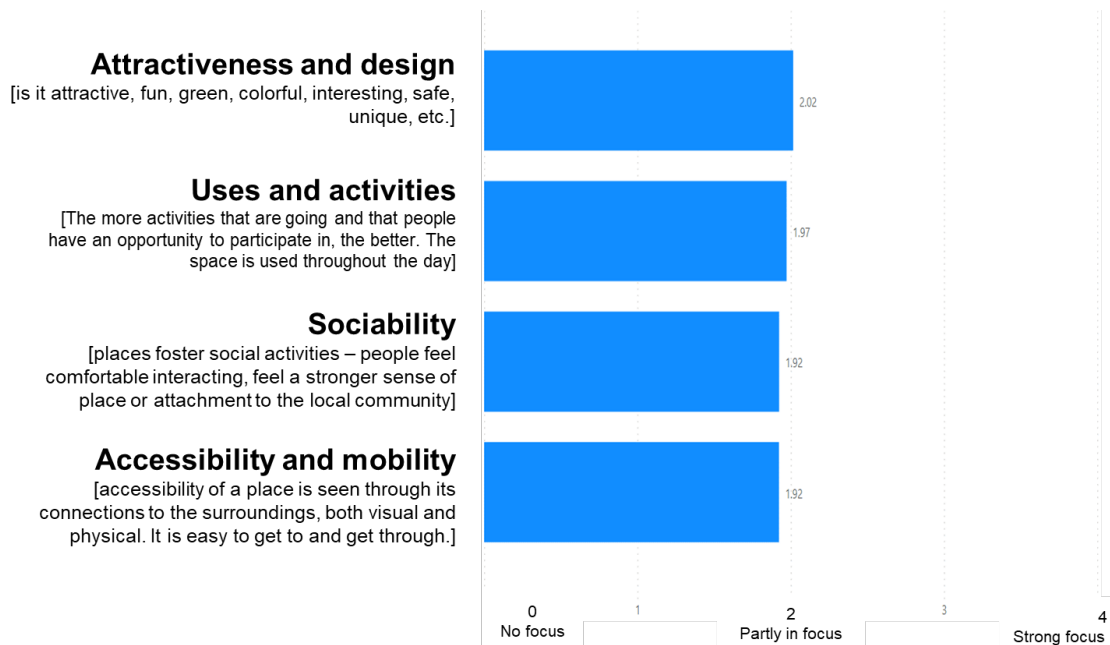


Figure 20 User's perception of the project's focus so far.

Respondents expressed that all aspects of the campus project have only been partly in focus to this day. There are no significant differences between all 4.

Users' recommendation for the future

- Moving forward, which topics should the campus development project focus the most on?

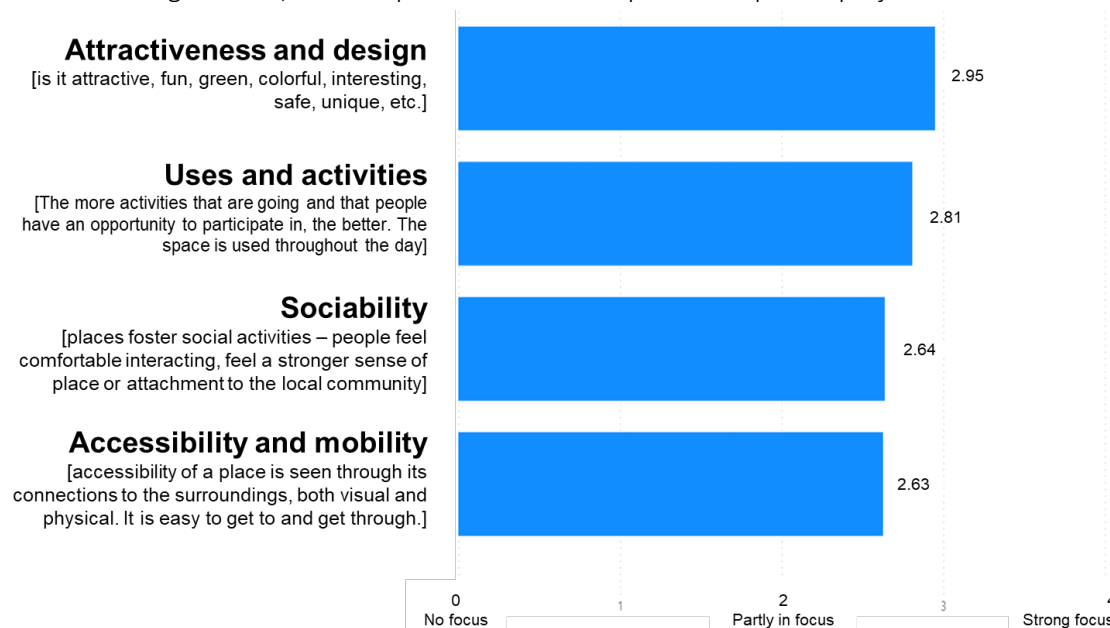


Figure 21 User's recommendations for the project's focus for the future.

There is a general trend that the project should continue to focus on all 4 aspects of “attractiveness and design”, “uses and activities”, “sociability” and “access and mobility”. However, they do push the cursor a little further than what they think the project has focused on until today (i.e. > 2).

Using the open field of the questionnaire, respondents also suggested that moving forward the project should focus on topics such as possibilities to influence the project, design/location of the spaces (built environment), Consequences of the project (e.g. on work environment), sustainable aspects of the project, project’s contribution to improving education, participation in the project (e.g. timeline, details, decision making).

Part 4- Participation methods and tools

This part addresses questions on users’ preferences for communication channels, platforms, and tools. The following questions were asked to users:

- Methods and Tools
 - How often do you use different communication mediums to share information?
 - Which setups/tools are most likely to motivate you to participate in a project?

Methods and Tools – average values.

This section focuses on identifying the methods and tools used by respondents and which ones would be likely to motivate them to participate in the project. Results are given both for the general population as well as according to different user groups.

- How often do you use different communication mediums to share information?

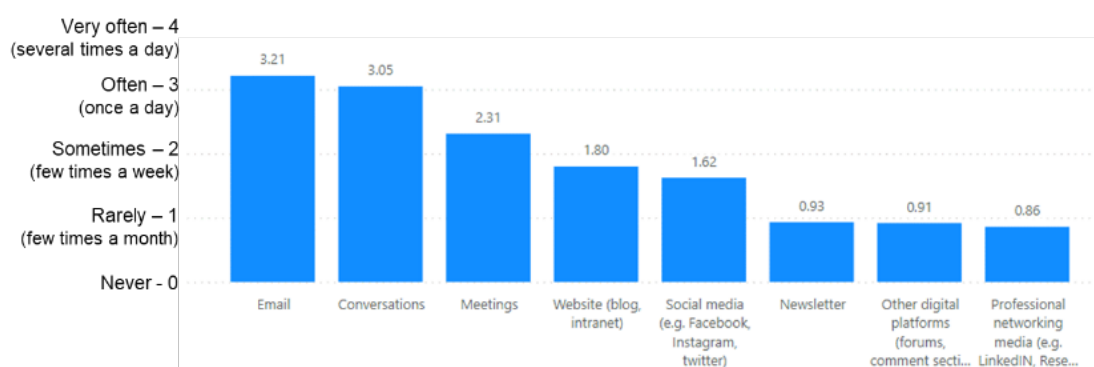


Figure 22. Methods and tools used by respondents to share information.

Looking at the results from the general population, emails, conversations, and meetings stand out as the three most used mediums for sharing information. Websites (incl. blogs, and intranet), and social media are also used but to a lesser extent. Professional networking (e.g. LinkedIn), other digital platforms, and newsletters stand very low.

- Which setups/tools are most likely to motivate you to participate in a project?

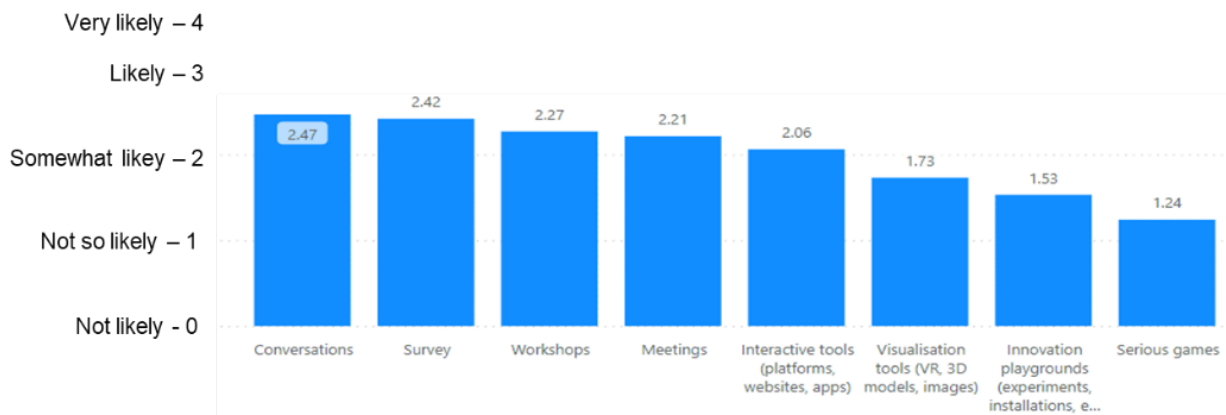


Figure 23. Setups/tools most likely to motivate respondents to participate in the project.

Respondents believe the tools most likely to motivate them to participate in a project would be conversations, surveys, and workshops. While innovation playgrounds and serious games may be less likely to motivate them to participate in a project.

Methods and Tools-Administrative staff

This section presents administrative staff views on the following questions:

- How often do you use different communications mediums to share information?

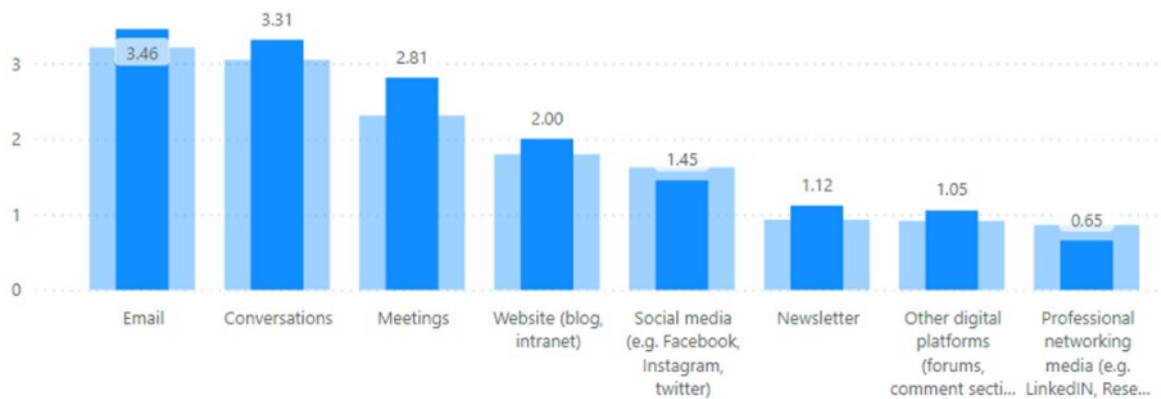


Figure 24. Communication mediums: Comparing average values with response from administrative staff

The response shows that emails, conversations, and meetings are the top three probable communication mediums administrative staff is likely to use to share information (above average). Digital platforms and a professional networking (e.g LinkedIn) are mostly unlikely to be used by administrative staff but websites, Newsletter and other digital platforms still score slightly above average for this group.

- Which setups/tools are most likely to motivate you to participate in a project?

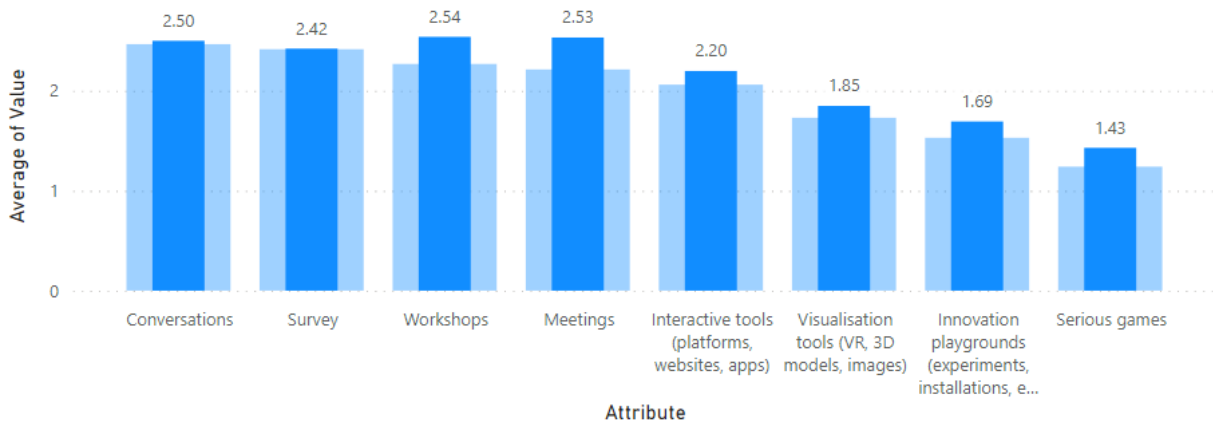


Figure 25. Setups/ Tools: Comparing average values with response from administrative staff

Generally, administrative staff prefer meetings, workshops, and conversations to motivate them to participate in a project, this is slightly above average when compared with the average values from all respondents

Methods and Tools-Scientific staff

This section presents scientific staff views on the following questions:

- How often do you use different communications mediums to share information?

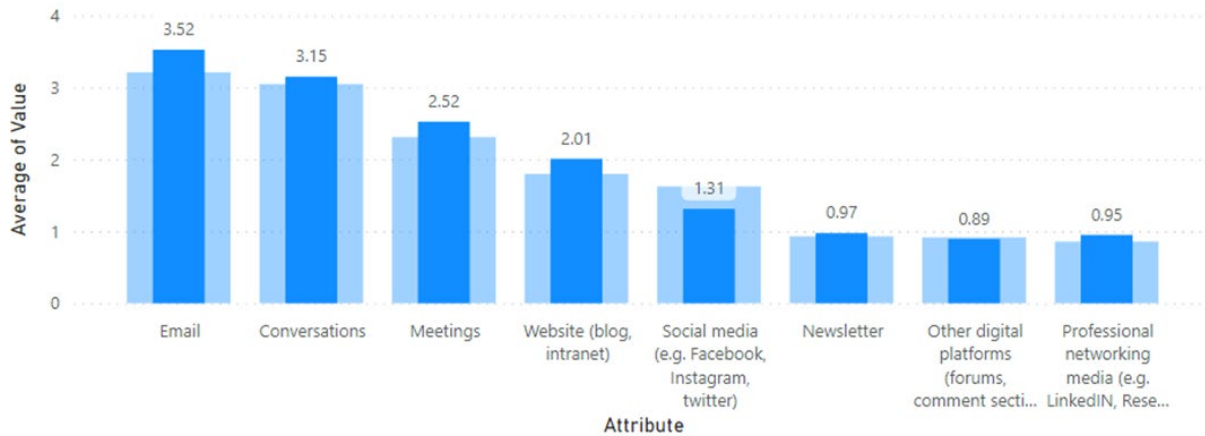


Figure 26. Communication mediums: Comparing average values with response from Scientific staff

For the scientific staff email, conversations, and meetings are the top three communication medium people are likely to use to share information. Social media score under average for this group. Results shows little or no interest in digital platforms (e.g., forums, comment section), and professional networking.

- Which setups/tools are most likely to motivate you to participate in a project?

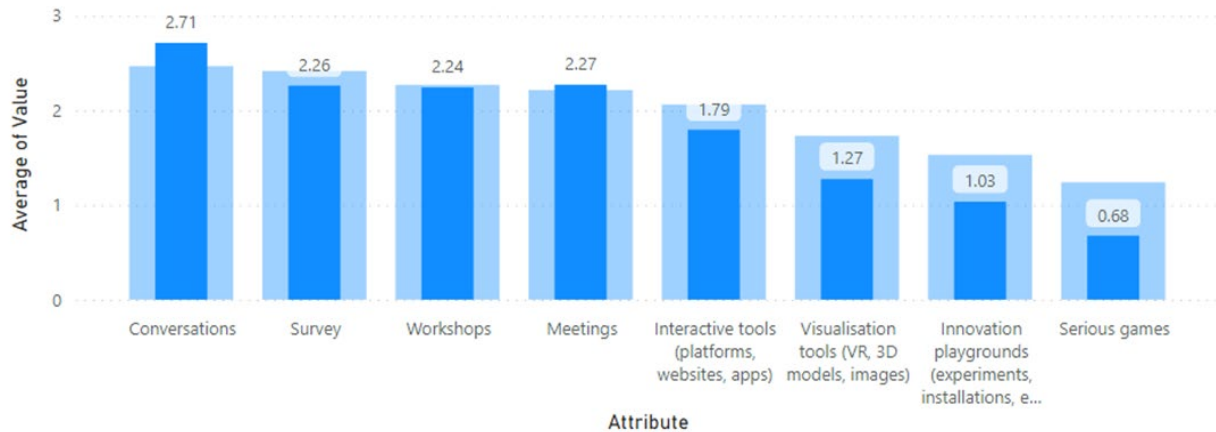


Figure 27. Setups/ Tools: Comparing average values with response from Scientific staff

Conversations, meetings, and surveys represent the three most likely setup/tools to motivate scientific staff to participate in a project. However, survey, and workshop rank slightly below average value.

Methods and Tools-Students

This section presents students' views on the following questions:

- How often do you use different communications mediums to share information?

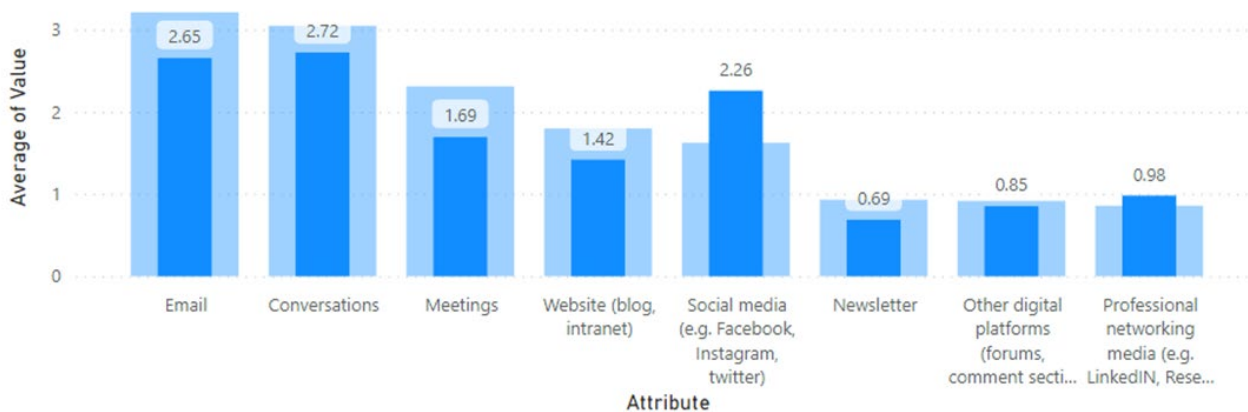


Figure 28. Communication mediums: Comparing average values with Student (incl. PhD)

Students selected conversations, emails, and social media (e.g Facebook, Instagram, Twitter, etc.) as key communication mediums likely to be used by students to share information. Out of the top three only social media rank way above average values. Conversations, email, and meetings are slightly below average values.

- Which setups/tools are most likely to motivate you to participate in a project?

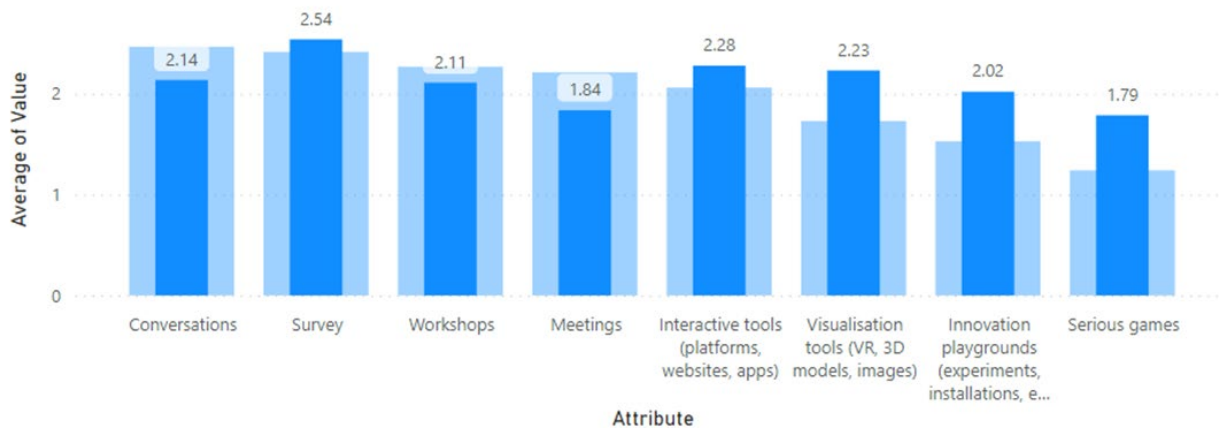


Figure 29. Setups/ Tools: Comparing average values with response from student(incl. PhD)

Students are most likely to be motivated by setups/tools like survey, interactive tools (e.g platforms, websites), visualization tools (e.g VR, 3D model) and “Innovation playgrounds” all ranked above average values. Conversations, workshops and meetings are all rated below average values.

Additional preferred tools/methods/channels mentioned by respondents include discussion forums, Microsoft teams, Slack, scientific publications, leader groups, dialog-based setups, and presentations with food serving (for students).

4 Discussion and Conclusion

This section emphasizes the most significant results, putting them into perspective to shed light on the weaknesses of the participation process and how to increase users' engagement in the campus development project.

- The students are less represented in the survey compared to their population size (104 respondents out of a total population of ca. 36 000 in Trondheim). Various factors could explain this:
 - Challenges linked to COVID-19, as students were away from the campus, their relationship to the place was altered which could explain a lack of motivation to engage in the survey.
 - Their lack of interest in taking part in the project, which is also expressed in the question about the degree of participation where they score below average on all five levels.
 - They are generally less informed about the project itself. This could be explained by the types of communication mediums they use to share and receive information (i.e., social media) as opposed to what has mostly been used to communicate about the project (e.g. website, emails, discussions)
- Different user groups use different communication mediums/channels and have different preferences in terms of tools that could motivate them to participate in the project. Students would be best addressed with more innovative tools (e.g. serious games, interactive tools, innovation playgrounds), while administrative and scientific staff mostly use conversations, emails and meetings).
- Respondents expressed that all aspects of the project (Attractiveness and Design, Uses and Activities, Sociability, and Access and Mobility) have only been partly in focus to this day but when asked about which aspects should be more in focus in the future, they symmetrically push the cursor further to emphasize the focus on all aspects. This gives us an indication between what they perceive of today's situation contra what they wish for the future.
- Users generally did not receive information about how they could participate in the project and expressed a lack of opportunities to give input. Channels of communication and focus areas of the project could be better considered in the communication strategy in order to improve the outreach of the project and the participatory process. For example, respondents are expressed an interest in participating in the project design, definition and use phases and receive mostly general and basic information as well as conflict related ones.
- Respondents consider themselves as important stakeholders in this project but do not think that decision makers perceive them as such. There is a discrepancy here that should be explored to reveal why this perception is dominant.
- Respondents are motivated to be physically present on campus to teach, study and conduct research work, which constitutes the core business of the organization. However, in a time with increasing digital processes for working and studying, there is also a need for physical spaces on campus where users could attend online meetings/lectures.

A significant finding in this study is that users do not necessarily wish to achieve the highest level of participation (i.e. Empowerment/Co-management), but mostly want to be informed, consulted, involved in a dialogue and collaborate in agenda setting. Scientific staff does put a stronger emphasis on all levels compared to the general population. Based on the findings from this survey, the following aspects require more attention in order to increase users' engagement and improve the participation

process in the Campus Development project. The channels of communication to disseminate information about the project should be adapted to different user groups. The nature of the information presented to the users should be better focused on addressing their concerns and requirements.

As a recommendation, we foresee that the impact of users' involvement in complex construction projects should be explored further to reveal the most adequate methods, tools and processes to facilitate interaction between all stakeholders. This would increase value creation through more effective user involvement.

5 References

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