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Learning from Innovations in Higher Education

Evaluation of innovation impacts of the Norwegian Centres for Excellence in Education initiative

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Management summary

To support innovation and enhancement of teaching and learning in Norwegian higher education, the Norwegian Ministry of Education and Research in 2010 established a policy for "Centres for Excellence in Higher Education" (the SFU initiative) as a focused and long-term effort. The ambition of the initiative was to contribute to the development of excellent quality in higher education and to highlight that teaching and research are equally important activities for universities and university colleges. One major goal of the SFU scheme is that the centres contribute not only to the enhancement of the quality of teaching and learning at their host institutions and consortia partners but also stimulate other higher education institutions in Norway (and beyond) to engage in these activities.

This study focusses on the extent educational innovations disseminate in the Norwegian higher education system. For this study, we conducted a review of literature on innovation in higher education, did scoping interviews, systematically analysed documents such as centre plans and their evaluations and held a sector-wide survey among potential adopters of SFU achievements within Norwegian higher education. (n=1.254).

The first question we address in this report is whether, and if so, how and to what extent, the SFU initiative has stimulated enhancement in teaching and learning (education) in the Norwegian higher education sector?

This study provides evidence that the initiative has stimulated enhancement in teaching and learning in the Norwegian higher education sector. Already prior evaluations of the more mature centres that were funded in the first call for the initiative pointed to their enhancement potential. The current study highlights how the initiative stimulates the enhancement beyond the funded institutions.

The survey revealed that 63% of the survey respondents answered that they know the SFU-initiative, and – accordingly – 37% did not know it. In the analysis of the survey data, respondents who provided sufficient data were assigned to one of the following Types: Adopters (6%), Adapters (25%), Observers (29%), and Not aware of the SFU-initiative (40%).

The distinction of Adapters and Adopters foremost represents how frequently the SFU-users have actively engaged with the SFUs and their innovations but both User-types might have adapted or even adopted the SFU enhancements. However, the profile of these two types differ. Adopters are predominantly institutional leaders and educational advisors. Adapters are more often professors and teaching staff.

Both groups report that educational enhancement is very important in their institutions. Important drivers for engaging in the enhancement and innovation of teaching and learning are personal interests in improving teaching skills, or their wish to try out a new educational approach. Adapters and Adopters assess the institutional readiness and overall climate for enhancement of teaching positively, and they are aware that enhancement is dependent on the provision of resources and institutional support.

A third User-Type we identified among the survey respondents are the Observers. These respondents know about the SFU-initiative but never used an SFU-achievements. They are the biggest group we identified, and their percentage is highest among the professors and other academic staff (more than 50% are Observers). However, Observers are also engaged in education enhancement but use other resources than SFU achievements. Compared with Adapters and Adopters, Observers perceive the readiness of their institutions and the availability of resources more often as limited.

Based on the evidence above we can state that the SFU initiative has stimulated education enhancement in the Norwegian higher education sector. The initiative, however, has been received differently among the different sorts of university staff. We find that members of institutional leadership and educational advisors engage with it and its achievements frequently, and a lot of them were classified as adopters. Academic staff who have teaching obligation do not employ or relate with the initiative as frequently. They are more often observers of the programme. This difference is mostly due to their divergent perception of the institutional readiness for the enhancement of education and to what extent they find that the SFU achievements fit their context. Respondents adopting SFU achievements were more positive about both aspects. Currently, observers doubt foremost that the SFU achievement would fit their teaching environment. For the future, it could be considered to make greater use of the adopters as disseminators, as they often have a leading role in their institutions. They could spread their experience of adoption within their institutions, and simultaneously show how the institution supports education enhancements.

The second questioned we researched is to what extent has NOKUT's management of the initiative contributed to or hindered the dissemination?

From the experiences of other national initiatives on the enhancement of teaching and learning, we identified five possible ways in which programme management can stimulate dissemination.

First, in the selection process, the programme management can already select those initiatives that have appropriate dissemination strategies. One experience from the first call was that the dissemination strategies of the SFUs were not well developed. Also, their actual dissemination activities often deviated and were more time-consuming than the planned ones. Therefore, the mid-term evaluation recommended a more strategic approach to dissemination. The NOKUT management took this into account, learned from this, and required applicants to develop more appropriate dissemination strategies in the second call.

Second, programme management can play a pivotal role in raising awareness about the need for enhancement in higher education and increasing excellence in teaching in learning. We conclude that the existence of the SFU initiative raised awareness about both. NOKUT contributed to this through employing several dissemination channels such as their a website, the SFU Magazine, podcasts, reports and conferences. However, the use and appreciation of these channels were rather low among the respondents. Most frequently, they mentioned having learned about the SFU initiative through word-to-mouth communication or from the calls for applications.

Thirdly, programme management can develop an infrastructure for knowledge exchange, knowledge building and continued dissemination of project results. NOKUT learned from the British CETL example, and consciously created a coherent network among the SFUs. Such a network facilitates interdisciplinary learning. Some interviewees who work in the SFUs doubted the usefulness of the network, and others were more positive about the network. This perception also depends on the topic or discipline of the SFU. SFUs that are located in disciplines that can be understood as an auxiliary science such as mathematics, teaching training or computing are more likely to connect to a broader range of disciplines as the SFUs that are located in disciplines that do not easily connect to other areas.

The last two ways in which the programme management can stimulate the dissemination of the initiative's achievements refer to a so-called Theory of Change. This theory guides the strategic choices of the programme management, its activities and interventions. This theory can guide the programme management in developing a set of projects that address different aspects and phases of the diffusion process of achievements and innovations. It can also help understanding how and why the desired change will happen in a particular context, and thus what activities are needed to make the initiative a success. NOKUT has not explicitly used such a Theory of Change. The document analysis made clear that the SFU initiative has moved to a stage in which programme management can learn from the first stages to develop such a Theory of Change and guide the dissemination and diffusion of teaching enhancements.

Our third question is what the lessons are for DIKU's management of the SFU initiative from 2019 and NOKUT's work with stimulating enhancement of teaching and learning in the Norwegian higher education sector?

From experiences abroad, as well as from the results of this study, we conclude that the programme management should go beyond the selection of the centres, administration of the overall budget and monitoring progress. In order to realise a more significant impact that goes beyond the SFU networks and communities, it is pivotal to realise an infrastructure that reaches out more broadly to teaching staff so that they can learn from the SFU results and exchange about the SFUs achievements more frequently.

As the SFU initiative is only one in a wide variety of initiatives for teaching enhancement in Norway, it could be useful to join dissemination forces. For example, an online portal that serves as a one-stop desk could help to spread knowledge and experiences of innovation in higher education across the country

Building upon the experiences of the current eight SFUs, the programme management can also help to improve dissemination strategies. For the next years, one may expect that SFUs have a clearer idea for dedicated forms of dissemination to realise the full innovation potential of their results. An essential tool in this is improved monitoring of impacts. So far, this was lacking in the annual reports and evaluations.

Considering the aim of the SFU initiative to have impacts at the system level and knowing that the dissemination and stimulation of education enhancement could disseminate top-down in the institutions, we suggest that DIKU should develop an explicit Theory of Change. Such a Theory of Change could be helpful in the selection process of new SFUs, monitoring and evaluation the impact of existing centres, and support the selection of appropriate dissemination channels.

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1. Introduction

1.1 The SFU initiative

To support innovation and enhancement of teaching and learning in Norwegian higher education, the Norwegian Ministry of Education and Research in 2010 established a policy for "Centres for Excellence in Higher Education" (the SFU initiative) as a focused and long-term effort. The ambition of the initiative was to contribute to the development of excellent quality in higher education and to highlight that teaching and research are equally important activities for universities and university colleges. In 2008, the Sternjø Commission first proposed the SFU scheme in its report 'A Holistic View –A New Structure for Higher Education' (NOU 2008). The government asked the Norwegian Association of Higher Education Institutions (UHR) to investigate the proposal further, and a committee chaired by Professor Kirsten Lykke (UiO) developed the framework for the SFU scheme in 2008–2009 (UHR 2009). During 2010–2012, criteria and guidelines were developed, and the government mandated NOKUT, the national quality assurance agency to select a pilot centre within teacher education. NOKUT was also tasked with managing the SFU scheme. In the autumn of 2011 NOKUT designated ProTed as the first SFU. In 2013, NOKUT awarded three more centres with SFU status after an open competition; a further round was opened in 2015. As a result, by 2019 eight Centres for Excellence in Education are in operation:

- CCSE - Centre for Computing in Science Education (2016), University of Oslo and University of South-Eastern Norway.
- CEFIMA - Centre of Excellence in Film and Interactive Media Arts (2016), Norwegian Film School.
- Engage - Centre for Engaged Education through Entrepreneurship (2016), NTNU and Nord University.
- ExcITEd - Centre for Excellent IT Education (2016), NTNU and Nord University..
- bioCEED - Centre for Excellence in Biology Education (2013), University of Bergen, University Centre in Svalbard and Norwegian Institute of Marine Research.
- CEMPE - Centre of Excellence in Music Performance Education) (2013), Norwegian Academy of Musik.
- MatRIC - Centre for Research, Innovation and Coordination of Mathematics Teaching (2013), University of Agder.
- ProTed - Centre for Professional Learning in Teacher Education (2011), University of Oslo and University of Tromsø.

The SFU status is awarded for five years plus five additional years subject to a positive interim evaluation. The first four SFUs have gone through this mid-term evaluation and all have been extended for five more years (NOKUT 2015; NOKUT 2017).

A major characteristic of the initiative is that it aims to promote excellence in R&D based education, ensuring that innovations are based on 'what works'. The SFU initiative was designed to further and reward work taking place in interaction between students, academic staff, support services, the labour market, professional bodies and the wider society, with due regard to the knowledge base of educational activities. The initiative also seeks to contribute to developing new forms of student involvement and partnerships.

The policy initiative awards proven excellence, hence SFU status is awarded to academic communities that have demonstrated excellent quality and innovative practices in education and that have plans in

place for further development and innovation. One of the important requirements in the SFU policy was that the centres must disseminate their results and knowledge to the wider higher education community in Norway and beyond.

1.2 Dissemination of SFU innovations

One major goal of the SFU scheme is that the centres contribute not only to the enhancement of the quality of teaching and learning at their host institutions and consortia partners but also stimulate other higher education institutions in Norway (and beyond) to engage in these activities. NOKUT's documents for the initial assessment of SFUs applications already stated that each SFU should function as a knowledge hub for innovation of teaching and learning practices and should strongly engage in dissemination (NOKUT, n.d.). Thus, the following understands that stimulating the enhancement of teaching and learning in Norwegian higher education sector strongly depends on how effectively SFUs disseminate their innovations and how this is supported by NOKUT's programme management.

Documents stating the award criteria for the two application rounds to the SFU scheme also extensively consider dissemination. Applications have to include detailed dissemination plans. Comparing the two rounds, however, shows that the evaluation criteria for dissemination have been developed further for the 2016 applications. For the 2010 applications, the criteria for assessment of dissemination addressed plans for the self-reflection of the achieved knowledge, the actual description of the dissemination of that knowledge to other educational communities, specification of target groups and means of communication, the engagement of the academic leadership in the dissemination as well as the plans stimulate educational enhancement in the host institutions (NOKUT, n.d., p. 5). The 2016 guidelines addressed dissemination in more practical terms (NOKUT, 2016). Applicants were required to "outline a clear plan for dissemination" and referred them to literature about effective dissemination strategies (Hamsworth & Turpin, 2000). Further, the guidelines advise applicants to specify their plans for sharing their developed knowledge and practices, involvement of other educational communities and stakeholder and a specification of dissemination strategies for their different target. Similar to 2010, the 2016 guidelines require to specify the engagement of the academic leadership in the dissemination. Thus, though the guidelines leave it to the applicants to elaborate their dissemination, these changes point to its importance in the SFU scheme.

The importance of dissemination and the role of SFUs to act as knowledge hubs is also considered in the current programme management. NOKUT provides various resources to support dissemination of the SFU. This is done through NOKUT's website offering information on the SFU, the programme scheme as such, links to the SFUs' websites, spreading news about centres' achievements. Further, NOKUT issues the SFU Magazine informing about developments and achievements of the SFU. Moreover, NOKUT supports the SFU through its own research as well as studies on quality enhancement in education. Lastly, NOKUT organizes conferences that, among others, provide SFU with the opportunity to exchange with their wider academic community.

This study looks into the extent to which the dissemination of innovations can be observed in the Norwegian higher education system. The following research question are used to guide this study:

1. Whether, and if so, how and to what extent, the SFU initiative has stimulated enhancement in teaching and learning (education) in the Norwegian higher education sector?

2. To what extent has NOKUT's management of the initiative contributed to and/or hindered this enhancement?
3. Based on 1 and 2, what are the lessons learned for DIKU's management of the SFU initiative from 2019 and NOKUT's work with stimulating enhancement of teaching and learning in the Norwegian higher education sector?

In the next chapter we give a literature review on innovation in higher education, as well as review experiences of similar initiatives in other countries. This review is used in chapter 3 to set out the conceptual framework and the methodologies adopted for this study. Chapters 4 and 5 report on two more explorative parts of this study. We did scoping interviews with number of actors from the Norwegian higher education sector, who were in different ways involved in the SFU-initiative. These were useful to get a first understanding of how the workings and impact of the SFU initiative was perceived. Further evidence for this came from a analysis of the plans, evaluations and other documents produced by the SFU centres. Chapter 6 reports the results of the survey conducted among potential adopters of the results of the SFU centres. Using a dissemination model dominant in the literature, the survey analysis acquaintance of potential adopters with the SFUs, actual use of results and possible drivers for such use.

In Chapter 7 we draw the main conclusions by answering as direct as possible the three research questions. The impact question is answered by synthesizing findings using the conceptual model we derived from the literature. However we also discuss put our findings in some broader perspective. As we were able through the survey to reach out to other possible adopters than teaching staff, we do reflect also on the role of institutional leaders and educational advisors. Their role in teaching enhancement is larger than conceptualised in most studies. In a similar vein we evaluate the role of NOKUT, looking at five roles programme management can play in to stimulate impact of a programme like this. Subsequently some lessons are drawn for DIKU, who is responsible for the programme management in the coming years.

2. Literature review

The literature review lays the groundwork for the other work packages by developing the analytical framework, upon which the empirical work will be based. The analytical framework is constructed using the insights gained through an extensive literature review.

To be more specific, the literature review aims to fully develop the analytical framework that guides the analysis in the study, to finalize rating instruments for the dissemination plans and activities of the SFU and to fully inform the research team on facilitators and hindrances to disseminating teaching and learning innovations in higher education as well as on adequate evaluation methodologies.

The literature review will feed the developments of the interview questionnaires for both the scoping interview study and the survey among potential innovation adopters. It will also feed the development of a coding scheme that will be used in the analysis of the SFU documents.

The literature review was conducted online, mostly on English-language publications, by using search terms centring on innovation, enhancement, dissemination, and quality and excellence in higher education. We aimed to find both 'grey' and more generally published scientific literature mainly through Google Scholar.

2.1 Dissemination of teaching and learning innovations in the literature

To structure the review of the literature of the dissemination of innovations on teaching and learning in higher education, this section is divided in a number of topics. We start with a discussion on educational innovations in higher education; what are these innovations, what are the sources of innovations and what are the conditions for innovations. What follows is a discussion on the dissemination of educational innovations: what is diffusion, the adopters' decision-making process, contextual factors and weighing of innovations. We close this section with a conclusion on the implications of the findings for the analytical framework constructed to analyse the Norwegian Centres of Excellence.

Educational innovations

In its essence innovation means introducing something new. However, this definition provides only limited information of the involved (social) processes, and 'Staff working in higher education often find it difficult to know if what they are doing in their teaching activities might be considered as being excellent [or innovative]' (Andersen Helseth et al., 2019). Somewhat more specific is the definition of Roberts (2007, p. 36): "Innovation = Invention + Exploitation", suggesting that an innovation is not only about 'something new', but also about utilisation. Focusing on 'something new', Premkumar & Roberts (1999, p. 468) state that: "an innovation is any idea, practice or object that is perceived as new by the adopter". Moreover, Southwell, Gannaway, Orrell, Chalmers, and Abraham (2010) state that innovations can concern an idea, product or service, and the change coming with an innovation in a certain context is presented as added value, usefulness or transformation of current practice. Consequently, both definitions of 'something new', stress that it is to be new in a certain context. As long as it can be seen as new in a specific context it can count as an innovation. However, an innovation is not the same as a change and as noted earlier has to have a utility. Some authors see that innovation link usability and change. Consequently they state that "Innovation is associated with improvement, and thus usually implies change for the better" (Silver, 1998, as cited in in Hsieh, 2007, p. 25). Hannan & Silver (2000, p. 10) agree, however, add that an

innovation does not necessarily have to lead to improvement: innovation is "a deliberate process (or product), directed towards (not necessarily achieving) improvement, which may involve originality or adaptation".

We see here an occasion to distinguish the term innovation from the term enhancement: for this study, innovation is fused for making a change towards something new (from a local perspective), while we use enhancement for changes that aim to achieve better results for the users (academics and, especially, students)—to avoid introducing even more terms, we will not go into the intricate relationships between enhancement, improvement and quality or quality assurance. Hence, in this report innovation focuses on the input and/or process of changing, i.e. the ideas, models, or products etc. and the patterns of interaction between members of an organisation that change. In contrast, enhancement focuses on positive outputs and outcomes of a change, even though enhancement of outcomes is not often actually measured (Kottmann et al. 2016). The two terms, in the meaning we give to them,[1] are intimately connected, since innovations usually aim to enhance an organisation's output even if they 'not necessarily achiev[e]' that aim, and enhancement usually needs innovation even if improved outcomes may also result from small optimisations of previous organisational practice that is not worth calling it an innovation.

We focus here on innovations in teaching and learning. A definition in this context that follows what has been discussed above is provided by Brennan, et al., (2014, p. 35): "A new or significantly improved product, process, organisational method or an organization itself developed by or having a significant impact on the activities of a higher education institutions and/or other higher education stakeholders". While their definition conflates innovation and enhancement, Brennan et al. (2014) recognise that innovations in the context of higher education may have limited impact: "many innovation practices do not radically modify the traditional higher education institutions' functions; rather, they provide new ways of doing traditional things that respond more efficiently to changing requirements in higher education" (Brennan, et al., 2014, p. 8).

Educational innovations can emerge in an unstructured or structured fashion: Unstructured innovations can emerge without paying much attention to their implementation and effects. For example, unstructured innovation happens when a teacher experiments with a didactical approach seen elsewhere, without documenting the implementation processes, or its effects. Consequently, the knowledge gained remains tacit, i.e. personal and implicit, making it more difficult to communicate about the innovation (Dee & Leisyte, 2016). The implicit nature hinders the innovation to be diffused.

Structured innovations involve planning and documentation, through which evidence-based educational innovations can emerge. These base on action plans and have certain goals. There is also monitoring of implementation and effects. Monitoring generates explicit knowledge which makes them more suited for diffusion. In the following, we focus on structured innovations, when studying educational innovations in the context of the Norwegian Centres for Excellence in Education.

[1] It should be emphasised that concepts such as innovation and enhancement are used by different authors in different ways; there is not a single, 'essential' and for every use acceptable definition of them.

Silver (1999, p. 154) distinguishes seven subtypes of structured innovations that relate to the sources of innovations:

- Individual and group innovations: e.g. a teaching method developed by a teacher.
- Disciplinary initiatives: e.g. innovation originating from a particular discipline, such as a new method to teach statistics.
- Innovation responding to educational media: e.g. the use a of new technology in an educational setting.
- Curriculum-promoted innovations: e.g. innovations in the area of content, assessment methods.
- Institutional initiatives: e.g. more top-down approaches, such as the introduction of a new educational model.
- Systemic initiatives: e.g. innovations in the higher education system, such as financial incentives to experiment with educational innovations.
- Systemic by-products: e.g. innovations as side effects of other policies and practices.

Innovations can have multiple steps in their development. For example, a systemic initiative can be further developed by a group of teachers. According to Silver (1999) each type of innovation – in its particular development step – requires different support: "… in relation to financial and moral support, and different opportunities for access to both in different types of institutions" (Silver, 1999, p. 155). In other words, the institutional context is important for the development of innovations.

The institutional context – the higher education system – is, however, not necessarily innovation-prone. In fact, Becher & Trowler (2001) suggest that resistance to new ideas is a key characteristic of academics, thus making higher education notoriously difficult to change for the better. Nevertheless, under external pressure, because of demands for efficiency, limited budgets and quality considerations, higher education institutions do appear to become more tailored to public demands (Dee & Leisyte, 2016). Educational innovations can play a role in this respect and having centres or departments within higher education institutions dedicated to this end may help to create institutional support for innovations (Holley, 2009; Huber, 1991).

For this study we assume that the Norwegian Centres for Excellence in Education perform this function as networks of teachers, researchers and educational specialists who engage in educational enhancement (Kottmann, 2017). Teachers and researchers who engage in the SFU frequently perform these roles alongside their other main roles and are supported by educational specialists. Within these networks mostly teachers and researchers develop educational innovations. As the SFU initiative requires the Centres to establish a dissemination strategy, it is intended that innovations find their way to the host and other higher education institutions. Through dissemination, innovations stimulate enhancement of teaching and learning in Norwegian higher education. Evidently, we assume that the developers of innovations are willing to share their innovations, as otherwise they would limit the potential impact of innovations (Örtenblad & Koris, 2014)

Dissemination and diffusion of educational innovations

Throughout Europe, many initiatives aiming to improve the quality of higher education have been launched. However, if innovations stay within one institution, the impact on the overall quality of higher education is limited. Consequently, dissemination of successful innovation is of vital importance to the quality of higher education. This sub-section elaborates on the concepts of dissemination and diffusion.

We take them together in this section as the literature often does not make a clear distinction between the two. Older studies such as McKenzie (2005) and Southwell (2005) which look at dissemination strategies include the uptake of innovations as part of the dissemination strategies. More recently, we see that dissemination is considered to be part of the strategies and responsibilities of the (innovating) Centres for Excellent Teaching and Learning, while the diffusion refers to innovation as a process through which new ideas and practices spread through organisations and sectors. According to Rogers (2003, p. 5) dissemination can be seen as "the process in which an innovation is communicated through certain channels over time among the members of a social system".

Scott and McGuire (2017) apply a more specific understanding of the spread of innovations, which they study as a diffusion process. Successful diffusion is accomplished when there is a sustainable change of practice in a social system. Stanford et al. (2017), starting from King's work (2007), state that there is a need to distinguish dissemination from propagation. With the former, they refer to the spread of information to raise awareness. To investigate how strongly academic development projects stimulate change of practice beyond the local context, they find 'propagation' a more adequate concept. Their research emphasises that the spread of innovations involves more than just making information about them public.

From the above follows that we conceive dissemination as the process of communicating a developed innovation with the objectives to share information, and eventually to stimulate a change of practice within other higher education institutions. Consequently, our concept of the innovation cycle includes dissemination to adopters who were originally not involved in the development of the innovation. This allows studying the tangibility, visibility, and usability of these innovations beyond their development context (Dee & Leisyte, 2016; Hsieh, 2007). Analogous to our distinction of innovation and enhancement then, we understand dissemination as the activities of the actor that first developed or introduced an innovation, while diffusion or propagation is the resultant outcome of other actors' uptake of the innovation. Dissemination is thus the communication of innovations, which may have various levels of aims, such as (1) raising awareness, (2) creating understanding and (3) generating action among potential target groups (Southwell et al., 2010). Successful dissemination thus brings about changes at different levels, ranging from mindsets to practices.

The innovation and diffusion may show several stages, which may be typified as:

- Enclave – initiation of an innovative practice;
- Bridgehead – implementation of the innovation beyond the initiator's enclave;
- Embedded practice – the acceptance of the innovation in the organization, displacing previous practices (Andersen Helseth et al., 2019, quoting Saunders et al., 2011).

This view takes the innovation as the point of departure. However, adopters have an active role in the innovation process: uptake requires local changes in each higher education institution. This is why we look at the diffusion processes that happen as a result of dissemination activities. Innovation adopters are frequently distinguished into 'lone rangers', 'early' and 'late adopters', and 'laggards' (Rogers, 2003). For diffusion it is important that 'lone ranger' innovators reach early adopters, who influence late adopters to also use the innovation (Taylor, 1998). Looking at a single organization, Taylor (1998) suggested that an organisation consist for 10% of lone rangers, and for of 10% early adopters. Important in this respect is that an innovation has to have a sufficient amount proportion of adopters to make the diffusion self-sustainable. With this in mind, and also looking at a single organisation, Rogers (2003) suggested, when it

comes to diffusion of innovations, that '*innovators*' comprise 2,5% of the organisation, 'early adopters' are 13,5%, 'early majority' 34%, 'late majority' also 34% and 'laggards' 16%. To reach a self-sustainable level of diffusion ('critical mass') the step from 'early adopters' to 'early majority' is vital. Consequently, diffusion plans are expected to account for this hurdle in the innovation and diffusion process; the threshold concept of critical mass also implies that dissemination activities may need to differ before and after surpassing this threshold.

For dissemination plans this means that they first should aim to influence the decision-making of potential (early) adopters. This involves the following five steps (Rogers, 2003, p. 20):

- Knowledge: creating knowledge of the innovation
- Persuasion: formation of a positive or negative attitude towards the innovation
- Decision: activities that lead individuals to decide on implementation of the innovation (or not).
- Implementation: the moment at which an innovation is implemented by an adopter
- Confirmation: stage in which the adopter seeks conformation for the decision to implement the innovation (good / bad decision).

To understand the impact of dissemination, it is important to include contextual factors that influence the decision-making of potential adopters. Some externally developed innovations (i.e. imported innovations) need to be adjusted to fit the local context such as e.g. the adopting institution's education model or vision (Dill, 1999). Even though such adapted or partial implementation may change the innovation, it can still be seen as impact of the original innovation. Consequently, in the context of SFUs, partial adoption of their (developed or imported) innovations form a successful contribution to the enhancement of teaching and learning in the Norwegian higher education system. However, it is also important to recognise that the effects of a (partial) adoption of an innovation can also be limited, non-existent or even negative in the new context (Rogers, 2003; Hladchenko, 2020). In this respect, Damanpour & Aravind (2012) warn adopters and managers against 'pro-innovation' bias in which they focus exclusively on positive (desirable and anticipated) effects without considering potential negative (side) effects.

The literature discusses a wealth of contextual factors that may impact potential adopters' decision-making. Summarised and clustered, the literature mentions (Tomas & Castro, 2011, p. 11; Roger & Shoemaker, 1997, p. 34; Brennan, et al., 2014, p. 9; Hsieh, 2007, p. 46; Smith, 2012; Premkumar & Roberts, 1999, p. 472; Hannan, 2005; Dee & Leisyte, 2016; Miner & Mezias, 1996; Boyce, 2003; Clark, 1998; Rogers, 2003; Mills & Friesen, 1992; Davis et al. 1982):

- Individual commitment: skills of staff and students to engage with innovative practices, willingness of staff and students to deviate from routines
- Support structures: leadership support and commitment to develop practices, existence of support groups such as mentoring groups or communities of practice in the adopting higher education institution
- Organisational factors: culture of an organisation (e.g. tolerance of risk taking), the extent to which higher education institutions prioritise education (vis-à-vis research), rigidness of educational and quality assurance regulations and procedures, unwieldiness of the institutions (larger institutions may be more difficult to change), level of autonomy of departments, faculties and institutions (e.g. having different cultures, educational visions and priorities)

- Economic and social factors: availability of time, financial room to implement innovations, external expectations, HR regulations and incentives, existing networks / relation structures between stakeholders (e.g. connections between innovators and potential adopters),
- Normative rules: unwritten rules of practice (e.g. "this is just how we do it"; "all the best do it")

The overview above again shows the complexity of educational innovations in the context of higher education. Silver (1999, p. 155) sums this up by stating that "The study of innovation in teaching and learning is a study of interactions, attitudes, institutional policies and practices, national contexts, and the consensual and confrontational characteristics of all of them".

Another aspect relevant for diffusion concerns the features of innovations and how these are evaluated by potential adopters. In other words, how innovations are rated affects their adoption, and thus their diffusion. Literature mentioned the following features of innovations as important to adoption (Rogers & Shoemaker, 1971; Rogers, 2003; Premkumar & Roberts, 1999, p. 468; Tornatzky & Klein, 1982):

- Relative advantage**:** degree to which the innovation is perceived as better than the idea it supersedes (Premkumar & Roberts, 1999, p. 471)
- Compatibility: degree to which it is perceived as being consistent with the existing values, past experiences and needs of the potential adopter (Premkumar & Roberts, 1999, p. 471)
- Complexity: degree of difficulty associated with understanding and learning to use an innovation [negatively associated with adoption] (Premkumar & Roberts, 1999, p. 471)
- Trialability/Divisibility: degree to which an innovation may be experimented with on a limited basis (Roger & Shoemaker, 1997, p. 155; Tornatzky & Klein, 1982, p. 37)
- Observability/Communicability: degree to which the results of an innovation are visible to others (Roger & Shoemaker, 1997, p. 155)
- Costs: innovations that are perceived to be low in cost are more likely to be adopted (Premkumar & Roberts, 1999, p. 471)
- Profitability: level of profit to be gained from adoption of the innovation (Tornatzky & Klein, 1982, p. 37)
- Social approval: status gained in one's reference group (Tornatzky & Klein, 1982, p. 37)
- Radicalness: "Radical innovations are defined as those that are ground breaking, disruptive, creating discontinuity, and changing the status quo" (Damanpour & Aravind, 2012, p. 436), hence they are less prone to adoption.

The literature on educational innovations appears to cluster the above features under two main factors: compatibility and profitability, both of which improve the chance for successful diffusion (Levine, 1980; Curry, 1992, as cited in Hsieh, 2007, p. 35).

Compatibility of an innovation entails that it fits the values, experiences and goals of the organization in which it is to be implemented (Levine, 1980). An important aspect of organisations is its culture, which Kuh & Whitt (1988, p. 28-29) define as "the collective, mutually shaping patterns of norms, values, practices, beliefs, and assumptions that guide the behaviour of individuals and groups in an institute of higher education and provide a frame of reference within which to interpret the meaning of events and actions on and off campus". Consequently, the culture of the institution codetermines its leading educational and innovation philosophy (Hsieh, 2007, p. iii). Therefore, we assume that diffusion of an innovation partly depends on its compatibility with the (educational) culture, values, experiences, mission, vision of (part of) the higher education institution and of potential adopters.

Profitability refers to the social and economic aspects of an innovation. The social aspects convey the degree to which the innovation accommodates the wishes of the users (e.g. students), the adopters (e.g. teachers) and the organisation. The assumed effect is that the implementation of the innovation will evolve the status quo into a more desirable situation (Levine, 1980). Economic aspects refer to, inter alia, benefits over costs, prestige, user-friendliness, satisfaction, efficiency, and effectiveness (Roger & Shoemaker, 1997). In this respect, self-interested profitability and general profitability can be distinguished (Levine, 1980). While the former affects individual motivation to implement and use the innovation, the latter concerns the motivations of an organization to do so.

Because we are particularly looking for diffusion effects of imported innovations, we also include *adoptability* as separate feature. We propose that this feature of an innovation informs the adopter of the extent to which an innovation can be inserted and changed to fit the local context. In other words, the degree to which aspects can be tweaked to match the earlier discussed contextual factors. Adoptability also relates to the earlier mentioned trialability, divisibility and (lack of) complexity.

Considering compatibility, profitability, and adoptability of innovations from the perspective of potential adopters, we assume that not all innovations developed by Norwegian Centres for Excellence are equally suitable for diffusion. Hence, we introduce in our conceptual model the rating of innovations as a step that adopters take. The more they evaluate an innovation positively across these three features, the more diffusion is expected to take place.

When research takes the potential adopters' perspective, the diffusion can be rated using the same concepts of compatibility, profitability and adoptability. This will allow our answering the question if the diffusion has been effective, which will reveal important information for the SFU programme management and the Centres for Excellence.

The model of dissemination used above is in principle linear: an innovation emerges within a core actor, who actively disseminates it to receivers who then decide if they want to adopt it. The innovation is a fixed entity (although it may be altered to fit in adopters' contexts) and the roles of innovator and adopter are fixed.

In another perspective on innovation and enhancement the focus is much more on localized innovation processes in which actors co-create innovations through sharing (cognitive and other) resources and include the user perspectives. (Prahalad & Ramaswamy, 2000, 2004) In higher education the notion of co-creation has been adopted to capture student involvement in education enhancement and innovation processes. Navarro-García et al (2015) apply co-creation for designing an online course environment, in which students from diverse European backgrounds take part with the goal of building competencies for communication and problem solving. Other examples include the co-creation of rubrics (Fraile, Panadero & Pardo, 2017) and co-creating learning analytics in higher education (Dollinger & Lodge, 2018).

While co-creation literature and practices, and related concepts, have increased, challenges still remain. One of the most critical challenges is the extra workload, time, and professional development needed to assist co-creation approaches and also the equity and range of voices and perspectives within co-creation approaches. (Healey, 2005; White, 2007) Based on more recent experiences, Bovill et al. (2016) show that such challenges can be overcome. However, co-creating learning and teaching is easier within

a course than in an entire programme. Even then co-creation requires a fundamental change in mindset of teachers and students.

Like in most of the literature on innovation and enhancement in higher education, co-creation focuses on the teachers as main innovators. From a (value) co-creation perspective, students as users are the stakeholders taking part in the creation process.

In the next section we learn that another perspective on co-creation would be possible. From that perspective innovators are stimulated to include teachers that are expected to adopt the innovation as stakeholders. Some of the teaching and learning excellence schemes abroad have moved towards such approaches. While these approaches resonate with the concept of co-creation, they are not framed like this.

2.2 Lessons from other teaching and learning excellence schemes

In recent years, across Europe a number of funding schemes have been implemented that aim at promoting excellence in higher education. Some of them work or worked with an approach similar to the Norwegian SFU scheme. In this section we look specifically at lessons learned about the dissemination and diffusion of innovations and the role of programme management in this.

Australia ALTC Grant Scheme

Australia has grant schemes supporting innovation in teaching and learning, funded in various forms since 1990. Schemes include that (of the predecessors) of the Australian Learning and Teaching Council (ALTC). While the ALTC was decommissioned in September 2011 and replaced by the Office for Learning and Teaching (OLT), a department of the Commonwealth Government, it has made considerable efforts to understand the dissemination of innovations in higher education. In 2004, the AUTC, one of the predecessors of the ALTC, commissioned two studies to identify dissemination strategies most likely to encourage changes in teaching and learning practices. (McKenzie et al., 2005, Southwell et al., 2005).

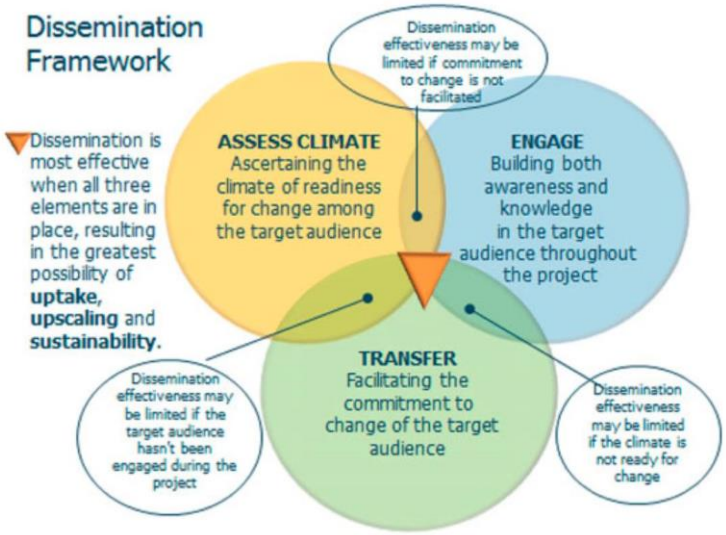
With regard to the dissemination of projects, McKenzie et al. (2005) recommend to “require applicants to consider approaches to dissemination which engage potential users throughout development and are focused on the intended adoption, implementation and embedding of project outcomes” (p. xiii). Such include the definition of target groups and strategies to engage with stakeholders and evaluation of impacts. They also acknowledge important factors the grant scheme can provide, such as providing adequate funding for dissemination activities. The report also signals the importance of dissemination after project completion, for which it recommends setting up an infrastructure to support and continue dissemination, adoption and implementation of project outcomes as well as successful aspects of the Center models. These recommendations are supported by the findings of Southwell et al (2005). In their report they conclude that effective dissemination requires active involvement of the programme management which should feel responsible for developing a national agenda for dissemination, and use a framework that recognizes different types of project (or project activities) aiming at different outcomes such as innovation, application, dissemination, transformation, research and scholarship.

More recently Gannaway et al. (2011, 2013) investigated the impact of the actual dissemination practices of educational development projects funded under this ALTC Grant Scheme, which since 2006 had used a dissemination framework. They find that effective dissemination plans for educational innovations in higher education have the following features (Gannaway et al., 2013, p. 418):

a. Dissemination is a planned process,
b. Innovators are aware about the field of potential adopters and engage with them,
c. Dissemination should be done throughout the project period.

From this, they develop their D-Cubed Dissemination Framework, which should underlie dissemination plans of educational development projects (Gannaway et al., 2013, p. 419). Thus, effective dissemination plans should include an assessment of the climate, strategies to engage with target audiences throughout the project and transfer strategies, i.e. plans how to facilitate commitment to change in the target audience (Figure 1).

Figure 1 D-Cubed Dissemination Framework (Source: Gannaway et al. (2013))



With regard to the Dissemination Framework ALTC had been using since 2006 in response to earlier studies, Gannaway et al (2011) find that this was only used by applicants to make their applications more convincing, but that it had hardly guided actual project activities. From interviews and workshop results they conclude that a "dissemination framework adopted by a funding organisation [should be] a potent tool for guiding and supporting a project leader's approach to dissemination, their formation of an appropriate dissemination strategy, and their selection of dissemination activities" (p. 54). To avoid perverse responses to the framework, such a framework should be inclusive to all elements necessary for successful dissemination.

UK: CETL-Programme of HEFCE

The CETL-Programme of HEFCE in the UK, running from 2005 to 2010, also intended the Centres for Excellence in Teaching and Learning to disseminate their achievements and teaching and learning innovations (HEFCE, 2004). Evaluations of the scheme addressed this as collaboration (SQW, 2011) or dissemination (Saunders et al., 2008). The grant competition included as an assessment criterion evidence of the Centre's capacity to disseminate and share knowledge and practices across the sector. Evaluation of the programme found that CETL have produced a substantial number of outputs (SQW 2011), used a

variety of instruments for sharing and collaboration (Saunders et. al 2008), but that changes across the sector hardly occurred. Rather, CETLs were found to have little impact even in their host institutions and rather to have worked inwardly (SQW 2011, Lawson, 2016). Disappointingly for our evaluation study, in neither the summative nor the formative evaluation have frameworks been developed to measure actual impact across the sector. In both evaluations dissemination activities of the CETL were described, but the use of the CETLs' innovations by potential adopters was not addressed.

In a report study on request of HEFCE, Trowler, Ashwin, and Saunders (2013) address the role of HEFCE in teaching and learning enhancement. Their study includes a number of HEFCE initiatives aiming to enhance teaching and learning, such as the CETL scheme or the Changing the Learning Landscape project. The study builds on a conceptual framework that embraces the following elements to estimate HEFCE's impact and conclude recommendations for its further role (Trowler, Ashwin, & Saunders, 2013, pp. 6–8):

- The policy levels addressed by the initiatives
- The scale and scope of the envisaged enhancement
- Policy instruments and mechanisms used to stimulate enhancement
- Change theory underlying the intervention
- The aims of the intervention
- The educational ideology underlying the intervention

The study draws on two major data sources. First, documents on HEFCE enhancement activities such as evaluation reports, scientific papers and HEFCE policy papers. Second, the study was based on interviews with key informants such as senior university leaders, representatives of national bodies engaged in enhancement of teaching and learning, as well as HEFCE officers. Though using a detailed framework, the research results do not clearly set out facilitators or barriers related to the actual management performance of HEFCE. With regard to system-wide enhancement of teaching and learning, the report just states that this would not have been achieved. Two factors that seem to be of relevance for this negative result are that (1) the CELT initiative was too much focused on rewarding individual performances in higher education innovation rather than on improving teaching and learning across the higher education sector, and (2) the lack of a systematic approach to improving teaching and learning at system level, including data and knowledge on requirements, findings, outcomes and effects.

France: Initiatives d'excellence en formations innovantes

In France, the competitive funding scheme "Initiatives d'excellence en formations innovantes" (IDEFI) supports higher education institutions to develop excellent education innovations since 2011. Its mid-term evaluation in 2015/2016 reviews the projects' dissemination activities as well as their local, national and international impact. With regard to dissemination, the evaluation used indicators showing the growth of the national IDEFI network such as the number of conferences for the network, and network presentations at other conferences. To measure the wider impact, the study looked, among others, at the number of modules developed in the IDEFI that are used or integrated in other study programmes in France. This evaluation thus considers to what extent education innovations are adopted outside their local development context. It hardly considered to what extent education developers have actively engaged with innovation adopters, apart from the approximate indicator of the number of teachers trained in the IDEFI's innovative practice (ANR, 2016).

Germany: Quality Pact for Teaching

The two evaluations of the German funding scheme "Qualitätspakt Lehre" (Quality Pact for Teaching) addressed, amongst other outcomes, to what extent innovations of the funded projects are used at other higher education institutions. To this end, the study used the perceptions of the project leaders and asked if innovations from their projects have been used or implemented in contexts beyond their own institution. However, the first evaluation neither considered dissemination channels and means, nor the perception of potential adopters (ZQ & Prognos, 2016). In the second phase of evaluation (ZQ & Prognos, 2018), the methods were extended to include thematic case studies, i.e. a number of persons involved were interviewed about e.g. internal and external transfer of innovative concepts.[2] Moreover, a survey was held under all teaching personnel in all higher education institutions involved in the Quality Pact for Teaching—not just those involved in the Quality Pact for Teaching-projects, but also other teaching staff; in total, more than 11,000 responses were received. This extended survey was mainly used to identify which areas of quality enhancement were addressed in the Quality Pact for Teaching-projects, but it did not address the mechanisms of dissemination.

Other relevant studies

Standford et. al (2015; 2017) developed the 'designing for sustained adoption instrument' to evaluate the potential of dissemination plans for their success in implementing educational innovations in higher educations. This instrument focuses on the potential of innovations for adoption evaluates propagation proposals with regard to four major factors (Stanford et al., 2017, p. 424):

- The amount of user modification expected,
- Degree of change to teaching practices required by instructors to adopt,
- Degree of cooperation required to adopt,
- Degree of resources required to adopt.

Stanford et al. analysed if and to what extent innovators took these factors into account when planning dissemination. Applying the instrument in the United States to NSF research proposals in the area of educational development revealed that 80% of the projects scored quite low on these factors for their propagation plans. The study further revealed that the same projects were also less successful in the actual propagation of their innovations. The authors conclude that the management of funding programmes should give stronger support projects to develop effective dissemination plans. Also, funding models should consider dissemination in more detail, i.e. provide more specified funding accommodating engagement with adopters, the type of project and the different aims of dissemination (see also Southwell et al. (2010)).

[2] Outcomes of thematic case studies are to be published later in 2019, but were not available at the time of writing our report.

2.3 Conclusion

The review of the literature made clear that innovation, dissemination and diffusion are broad concepts that point to a variety of phenomena. Innovations might refer to processes, practices, structures or ideas, which can be adopted fully or partially, in the original form (adoption) or adapted to local contexts Dissemination points to raising awareness on the one hand and on the other hand to propagation of innovative practices. Diffusion refers to strategies of individual adopters at various stages in the diffusion process, innovation processes at institutional and national level, as well as the role of non-adopters and contextual factors.

In the first part of this chapter we reviewed literature on the dissemination and diffusion of teaching and learning innovations in higher education. By and large, we have found five major components in this process: the type of innovation, the adopter's decision-making process, contextual factors, and rating of innovations. In sum, these components can be described as:

- Type of innovation: emergent vs. imported, bottom-up vs. top-down, tacit vs. explicit knowledge, individual and group innovations, disciplinary initiatives, innovation responding to educational media, curriculum-promoted innovations, institutional initiatives, systemic initiatives, and systemic by-products;
- Steps in the adopter's decision-making process: knowledge, persuasion, decision, implementation, and confirmation;
- The perception and responses of non-adopters within the organisation or higher education sector towards the innovations;
- Contextual factors: individual commitment, support structures, organisational factors, economic and social factors, and normative rules;
- Rating of innovations: compatibility, profitability, and adoptability of innovations.

Our analysis of the dissemination activities by the SFU's will build on the work of Gannaway et al. (2013) and of Stanford et al. (2017). According to Gannaways D-Cubed Dissemination Framework effective dissemination plans should include an assessment of the climate, strategies to engage with target audiences throughout the project and transfer strategies, i.e. a plan how to facilitate commitment to change in the target audience. Stanford the 'designing for sustained adoption instrument' to evaluate the potential of dissemination plans for their success.

Dissemination strongly depends on how the innovator engages with potential adopters of the educational innovations. Thus, successful dissemination is not only dependent on the means used to communicate the innovation but also whether the development of the educational innovation already includes the needs and perspectives of potential adopters beyond the SFU. To address this, our study uses a framework that will study the SFU and their dissemination activities as well as surveys potential adopters and their perception of the innovations.

Central to studying the potential adopters will be the analysis of their decision processes related to adopting educational innovations. Based on Rogers (2003) the research addresses five stages of this process (Scott & McGuire, 2017, p. 121):

- How potential adopters become aware and knowledgeable about the innovation (here the dimensions of the 'designing for sustained adoption assessment instrument' will be used);
- What features of the innovation persuades them to adopt it;

- What rationales underlie the decision to adopt (we expect to learn from this how well SFU innovations respond to demands and needs beyond their development context);
- How adopters organise the implementation of the innovation at their site (including engagement with SFU during adoption);
- How adopters support the sustainable use of the innovation.

Few studies take the role of programme management into account. Those studies that do address this issue, all done on request of programme management bodies, conclude that programme management is important in five ways.

- Through the selection processes programme management can select those initiatives that have appropriate dissemination strategies;
- Programme can play a pivotal role in raising awareness about the need for innovation in higher education and increasing excellence in teaching in learning;
- Programme management can develop an infrastructure for knowledge exchange, knowledge building and continued dissemination of project results;
- Programme management can develop a Theory of Change at system level to guide its strategic choices, own programme activities and interventions.
- As a result of the Theory of Change, programme management can develop a varied set of projects that address different aspects and phases of the diffusion process of innovation.

A Theory of Change makes explicit through a comprehensive description how and why a desired change is expected to happen in a particular context, and thus what activities are needed to make the initiative a success.

These insights of the literature review will be used throughout the report and at the end also used as input to the conclusions.

3. Analytical framework and methodology

Our first research question reads:

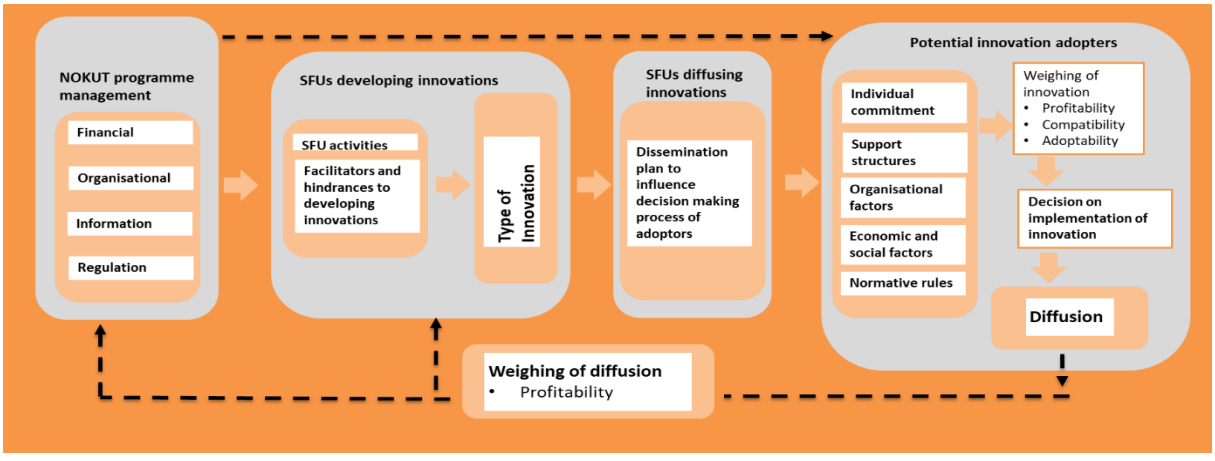
"Whether, and if so, how and to what extent, the SFU initiative has stimulated enhancement in teaching and learning (education) in the Norwegian higher education sector?"

As stated above, our approach to answering this question is to study the dissemination practices of the SFU. This requires investigating their dissemination plans as well as how potential adopters have received their innovations. The literature review in the previous chapter made clear that successful dissemination strongly depends on how the innovator engages with potential adopters of the educational innovations. Thus, successful dissemination is not only dependent on the means used to communicate the innovation but also on whether the development of the educational innovation already includes the needs and perspectives of potential adopters beyond the SFU. Therefore, our study uses a framework that will study the SFU and their dissemination activities as well as potential adopters and their perception of the innovations.

Further, the review of the literature made clear that dissemination and innovation are broad concepts that point to a variety of phenomena. Dissemination points to raising awareness on the one hand and, on the other hand, to the propagation of innovative practices. Innovations might refer to processes, practices, structures or ideas, which can be adopted fully or partially, in the original form (adoption) or adapted to local contexts. Our research thus addresses the goals of the dissemination and types of innovation and creates a typology of both.

The study thus employs a framework that uses a broad view of the dissemination process related to the SFU initiative. We consider successful dissemination as key to stimulating the enhancement of teaching and learning. Our study addresses three categories of actors involved in the enhancement: the SFUs, potential adopters (i.e. other Norwegian higher education institutions) and NOKUT as programme manager. We study, firstly, the relationship between the SFU and potential innovation adopters. Secondly, we study how NOKUT programme management supports the SFU, the potential innovation adopters and how it facilitates the relationship between the SFU and the potential adopters. The framework is presented graphically through Figure 2. We will elaborate on each of the boxes of the framework.

Figure 2 Conceptual framework for the study of innovation dissemination



NOKUT programme management

Management of the SFU scheme is a complex task. The SFU policy can be seen as a programme that includes a collection of projects (the individual SFUs) and which has goals at the programme level over and above the aims of the separate projects (Thiry, 2002). Hence, managing a programme requires managing the projects as well as the programme level itself. Both for project management and programme management, several methods are available, though many methods are mostly geared to industry and, e.g., software development contexts. For our evaluation of NOKUT's management of the SFU scheme, we take inspiration from methods in the literature that are geared to a public policy environment and to a programme that consists of relatively separated and independent projects. Trowler et al. (2013) noted as broad critical success factors for an effective enhancement strategy:

- Efficient and effective ways of establishing need and of measuring the real costs (including 'hidden' costs) and effects of interventions;
- Priorities that are addressed consistently, with clear leadership, over extended periods of time and with consistent attention paid to long-term sustainability;
- Particular specialisms and missions of the different bodies focused on enhancement are deployed fully by encouraging a 'joined-up' enhancement strategy;
- The student voice and collective student interests are included;
- Planning times and planning processes make adequate provision for engagement across the sector, based on a robust causal theory of change and mindful of usability characteristics;
- Account is taken of different institutional missions and contexts;
- Politicians' sometimes unrealistic visions are converted into realistic proposals;
- Changes are effected beyond the 'usual suspects' to those rooted in the heart of day-to-day teaching and learning, effecting a culture change across the system which incorporates a genuine commitment to evaluate practices, to address deficiencies and to build on successes.

Another concept applicable to the evaluation of programme management is the managing organisation's maturity. *Maturity* concerns the degree to which key programme management processes and tools are applied in NOKUT, varying from not or scattered, to fully integrated in the organisation and at the top level also continually improved (Kwak & Ibbs, 2002).

In the literature, we found a list of five key roles of programme management, through which it can steer an SFU like initiative.

- Through the selection processes programme management can select those initiatives that have appropriate dissemination strategies;
- Programme management can play a pivotal role in raising awareness about the need for innovation in higher education and increasing excellence in teaching in learning;
- Programme management can develop an infrastructure for knowledge exchange, knowledge building and continued dissemination of project results;
- Programme management can develop a Theory of Change at the system level to guide its strategic choices, own programme activities and interventions.
- As a result of the Theory of Change, programme management can develop a varied set of projects that address different aspects and phases of the diffusion process of innovation.

SFU developing and disseminating innovations

The analytical framework considers SFU as innovators, i.e. as developers of educational innovations. The research will thus zoom in on their innovations, their dissemination plan, dissemination activities, and how they engage with potential adopters. The goal of this part of the research is to evaluate the innovation potential of the SFU, i.e. to what extent they can develop and successfully disseminate educational innovations, as well as to what extent they have successfully done so. To this end, the data collection and analysis will be guided by a coding scheme for SFU documents (see Chapter 4).

Finally, factors that facilitate or hinder the dissemination activities and the role of the project management will be investigated. As stated above, the review of Smith (2012) states major factors that might facilitate or hinder the diffusion of educational innovations. The SFUs will be studied for these and other factors that might be stated by the SFU. Concerning project management, the study will adopt some elements of the framework of Trowler, Ashwin, and Saunders (2013). These include the SFUs' understanding of the purposes of the SFU programme, next to their evaluations of the instruments used by NOKUT to support their dissemination activities on the one hand and the adoption of innovations by potential users on the other hand.

Potential innovation adopters

To date, evaluations of the impact of excellence scheme in teaching and learning have hardly included potential adopters' perceptions of educational innovations resulting from the funded projects. We strongly believe that it is essential to include this group in the study as they decide whether to adopt, adapt or ignore innovations, and thus about whether the excellence scheme stimulates the enhancement of teaching and learning across the sector. As potential innovation adopters, we understand staff at all types of higher education institutions in Norway.

This part of the research addresses how the potential adopters perceive the innovations set out by the SFUs, features of their decision processes related to whether to implement educational innovations, factors that facilitate or hinder the implementation of educational innovation at the site of the adopters and their perception of NOKUT's SFU programme management and the instruments used to support adopters.

3.1 Study phases

Document analysis

The knowledge base at NOKUT's SFU website provides the application documents and annual reports of the current SFUs. These can be understood as an extensive database that provides information on the SFUs' dissemination plans and activities. Both the applications and the annual reports are analysed using the concepts from the analytical framework to study SFUs as educational innovators. This analysis aims at establishing a summary of the innovation potential of the current SFUs. There are different report formats for the four established SFUs awarded in the first application round and the four more recent SFUs awarded in the second application round. For the older SFUs, external mid-term evaluation reports are available as well.

Our analysis of the dissemination plans, activities and innovations builds on the work of Stanford et al. (2017) and of Gannaway et al. (2013). Both sets of authors have developed concepts that we adapt to

study the SFUs' innovation capacity. Gannaway et al. (2013) investigated the dissemination practices of educational development projects funded by the Australian Learning and Teaching Council (ALTC) or one of its predecessors. They find that effective dissemination plans for educational innovations in higher education have the following features (Gannaway et al., 2013, p. 418):

- Dissemination is a planned process,
- Innovators are aware of the field of potential adopters and engage with them,
- Dissemination should be done throughout the project period.

From this, they develop their D-Cubed Dissemination Framework, which should underlie dissemination plans of educational development projects (Gannaway et al., 2013, p. 419). Thus, effective dissemination plans should include an assessment of the climate, strategies to engage with target audiences throughout the project and transfer strategies, i.e. a plan how to facilitate commitment to change in the target audience. Stanford et al. (2015; 2017) developed the 'designing for sustained adoption instrument' to evaluate the potential of dissemination plans for their success in implementing educational innovations in higher educations. This instrument focuses on the potential of innovations for adoption evaluates propagation proposals with regard to four major factors (Stanford et al., 2017, p. 424):

- The amount of user modification expected,
- Degree of change to teaching practices required by instructors to adopt,
- Degree of cooperation required to adopt,
- Degree of resources required to adopt.

Stanford et al. analysed if and to what extent innovators took these factors into account when planning dissemination. Applying the instrument in the United States to NSF research proposals in the area of educational development revealed that 80% of the projects scored quite low on these factors for their propagation plans. The study further revealed that the same projects were also less successful in the actual propagation of their innovations. The authors conclude that the management of funding programmes should give stronger support projects to develop effective dissemination plans. Also, funding models should consider dissemination in more detail, i.e. provide more specified funding to accommodate engagement with adopters, the type of project and the different aims of dissemination (see also Southwell et al. (2010)). The coding scheme is in Annex 1.

Scoping interviews

Scoping interviews are included in our study to collect data about the three major questions guiding the study. Their major purposes are gathering information about the number and primary characteristics of innovations in the SFUs that are not available from documents, as well as learning how the SFU scheme and its management are perceived in the Norwegian higher education system to adapt the following survey to respondents' range of experiences. The scoping interviews were held face-to-face – with one telephonic exception – and fully transcribed. Respondents include four groups of interviewees: representatives of the SFUs, representatives of NOKUT, representatives from other higher education institutions interested in but without a current SFU, and other stakeholders as well as experts on higher education in Norway.

Interview schedules and a list of interviewees in the scoping interview are included as Annexes 2 and 3.

Questionnaire among potential adopters of innovation

To study the adopters' perceptions of the innovations, facilitators and hindrances to adopting educational innovations and their perception of NOKUT's SFU programme management, we use the same concepts as for the study among the SFUs. However, the concepts are adapted to the receivers' point of view following the scoping interviews.

Central to studying the potential adopters is the analysis of their decision processes related to adopting educational innovations. Based on Rogers (2003), the research addresses five stages of this process (Scott & McGuire, 2017, p. 121):

- How potential adopters become aware and knowledgeable about the innovation (here the dimensions of the 'designing for sustained adoption assessment instrument' will be used);
- What features of the innovation persuades them to adopt it;
- What rationales underlie the decision to adopt (we expect to learn from this how well SFU innovations respond to demands and needs beyond their development context);
- How adopters organise the implementation of the innovation at their site (including engagement with SFU during adoption);
- How adopters support the sustainable use of the innovation.

The questionnaire also addresses general facilitators and hindrances to implementing educational innovations at the faculty as well as potential adopters' perceptions of NOKUT support in dissemination/adopting SFU innovations.

The population of the online survey consists of all academics (teachers/researchers) including, in particular, those with a leadership role in education at faculty level, such as vice-deans for education or similar roles from all types of higher education institutions in Norway, next to professional officers involved in education quality enhancement in those higher education institutions. The sample is not restricted to the disciplines that are represented by the current SFUs to investigate the overall stimulation of the Norwegian higher education sector. This allows us to distinguish between disciplinary and cross-disciplinary dissemination in our analysis.

The online questionnaire includes closed and open questions, leaving respondents the opportunity to inform about their special situation. The questionnaire goes included as Annex 4.

4. Document analysis

The knowledge base of NOKUT's SFU website provides the application documents, annual reports of the current SFUs, and for the first four SFUs evaluation reports as well by external experts to inform the decision on awarding the second tranche of the project grant for the next five-year period. Together, these reports can be understood as an extensive database that provides information on the SFUs' dissemination plans and activities. The three types of reports have been analysed using the concepts from the analytical framework to study SFUs as educational innovators. This analysis aims at establishing a concise summary of the innovation potential and dissemination activities of all eight current SFUs. There are, of course, different report formats for the different 'cohorts' of SFUs.

For all SFUs, our analysis of the application documents includes the dissemination plans:

- Planned dissemination channels
- Type of planned innovations
- Purpose of the dissemination
- Plans to engage with potential adopters

To the extent available (for longer-established SFUs more than for more recent ones, evidently) we analysed additional annual reports, and where available mid-term external evaluation reports, about actual implementation – they are analysed regarding:

- Used dissemination channels
- Innovations developed so far
- Adoption rate: how many and to what extent have innovations been adopted
- Changes to dissemination plans
- Exchange with potential innovation adopters

These issues were also addressed—through a partly different conceptual framework—during the interim evaluations of ProTed and of the 2014 SFUs, bioCEED, CEMPE and MatRIC. Notwithstanding good intentions on all sides, 'there was often a tone and attitude of defensiveness' in the communication between the SFUs and the evaluation panel about innovations and the success (or otherwise) of their dissemination (Andersen Helseth et al., 2019, p. 37); we are aware that we are dealing with sensitive issues. Moreover, we do not hold a model in mind of linear implementation of a proposal; like the evaluation committee of ProTed put forward: 'no matter how well written the original proposal was, the Expert Committee would expect to see dynamic development of plans in response to findings from research activities and to changing external circumstances' (NOKUT, 2015, p. 7).

4.1 Longer-established SFUs

ProTed's application contained five work packages, the former three each focusing on what can be seen as an innovation that could be disseminated—dissemination being the focus of Work packages 4 and 5.[3]

Table 1 Activities and interim evaluation ProTed

'Innovation' / Work package	Evaluation judgment
WP1: To disseminate and research innovative practices in foundational courses, including pedagogy and didactics, and to strengthen excellent practices in the integrated study design.	'the most difficult to evaluate, possibly due to the interim point of this evaluation and the nature and scale of the WP. Task 1, specified in the application, involves the selection of five high-quality practices that will be investigated, evaluated, improved and integrated – but so far the five practices have not been identified. Instead, there are a large number of ongoing projects in the subject areas at UiO and also some at UiT.'
WP2: To develop high-quality practice arenas [University Schools]	'very successful' (p. 13); 'although partner schools is not a new idea in teacher education, ProTed has developed the concept of "University Schools" extensively and effectively and has provided insight into how these partnerships can benefit teacher education in innovative ways.' (p. 14)
WP3: To strengthen ICT integrated supervision and feedback	implementation at early stage (p. 14)
WP4: To develop online and on-campus cross-disciplinary modules, seminars and courses for teaching staff and study programme leaders at UiO and UiT.	'the idea of creating courses for teacher educators (WP4) has also been modified to more organic forms of staff development' / 'change was necessary as securing participation in such courses, had they been developed, would have been extremely challenging.' (p. 15)
WP5: To challenge traditional educational practices and develop high-quality TED professional learning designs for diverse learning arenas.	'ProTed has dropped the goal of establishing an online journal … choosing, wisely in the Expert Committee's judgement, to use established publication channels.' 'the Expert Committee commends ProTed for the introduction of the "Knowledge Parliament" organised for autumn 2015' (p. 11)

Source: NOKUT, 2015.

The interim evaluation (NOKUT, 2015) shows that some specific innovations were successfully at the local level (WP2, WP4) and/or nationally (WP2, WP5). For other elements, the interim evaluation came too early (WP1, WP3, partly WP5). 'Impact on the international level is still embryonic, but the Expert Committee considers it likely this will increase as ProTed's work becomes more mature' (p. 21). Local impact went beyond the separate work packages: 'The integrated study design of the curriculum at both institutions is very strongly influenced by the work done in ProTed' (p. 19).

However, the dissemination channels and activities—which were described in a separate section of the application document—partly operated across several work packages and 'it appears staff members were somewhat overwhelmed by the volume of this task [=dissemination in general]. In several places, the self-evaluation report voiced a fear that the demands of dissemination activities threatened to take away attention from the actual research and development' (p. 11). Besides, the dissemination channels themselves were not unproblematic; in particular, the ProTed team struggled with online communication (website or social media; a new online journal or established channels). The innovative dissemination

[3] See www.uv.uio.no/proted/english/, last accessed 2019-12-23.

activity of a 'knowledge parliament' gained accolades from the evaluation panel, and they were repeated at least in 2016 and 2017.[4]

BioCEED's work plan for the first five years specified 35 activities (source: application form) across seven work packages, later re-organised for reporting in four focus areas. In those early years, dissemination and monitoring of impact were not treated separately, although work packages 6 and 7 focused on dissemination (as did one activity in work package 5), while one activity mentioned 'experimenting' implying some degree of assessment of impact of new learning methods (source: application form). BioCEED's work was evaluated in 2017 (Expert Panel, 2017).

Table 2 Activities and interim evaluation BioCEED

'Innovation' / Focus area	Evaluation judgment
1: Teacher culture	'The Centre played a pivotal role in the development of a teaching reward system at the University of Bergen, and was often used as an exemplar of good practice.' (p. 8)
2: Innovative teaching	2.1: 'the bioSKILLS platform has a lot of potential to support innovative teaching on a national and international scale.' (p. 9) 2.2: 'The students and the stakeholders were full of praise for the intern scheme' (p. 9)
3: Practical training	3.1: '… work practice courses and a new dissemination project course. Students reported finding these courses very useful. Whilst these were elective courses, they had the potential to be accessed by a greater number of students.' 3.2: 'The bioSKILLS platform again has the potential to support the Centre's work in this area' (p. 9)
4: Outreach	4.0: 'large impact on its host institutions and became visible in higher education discussions across Norway.' 4.1: 'For example, its work was highlighted in the recent Higher Education White Paper.' 4.2: 'The development of the National Forum for Educational Leadership in Biology with Biofagrådet has the potential to further extend the work of the Centre across Norwegian universities.' (p. 9)

Source: Expert Panel, 2017.

The evaluation panel emphasised that a broad area of activity (area 1: teacher culture) had local impact though unsurprisingly it was hard to pin down the exact changes involved in a change of culture ('exemplar of good practice'), although a specific element was singled out, i.e. the reward system, which also gained national repute and support. The elements mentioned in areas 2 and 3 involved a change of the educational approach towards more practice-orientation and (transferable) skills biologists need: this might be seen as a complex of innovations spurred by a single idea.

Area 4 concerns all dissemination activities, across the different areas of BioCEED, combined with intended impact.

In CEMPE, work in the first five-year phase concentrated on three areas (Expert Panel, 2017), although the application had listed seven 'project' areas (source: application form). For dissemination, the applicants saw two audiences: fellow-music academies and the (music teaching) research community. The

[4] See www.uv.uio.no/proted/aktuelt/arrangementer/, last accessed 2019-12-23.

former were to be reached through networking and workshops/seminars/performances, the latter through conference contributions and publications (in journals and books, website). The general goal of enhancing music performance teaching and learning was not operationalised in specific impact, beyond the equally general statement of the centre's value-added (in terms of its contribution to its host institution).

Table 3 Activities and interim evaluation CEMPE

'Innovation' / Work area	Evaluation judgment
'to 'de-privatise' music education'	'clearly been successful in shifting culture, breaking down barriers between teaching staff' in different genres' (p. 14) 'Students ... could see strong benefits from being involved'
'sharing of experiences across genres to enhance students' instrumental practices'	
preparing students for successful engagement in a rapidly changing globalised music society	'Students ... could see strong benefits from being involved. Stakeholders were very positive about the potential of the Centre to support students' engagement with a globalised music society and in establishing partnerships with organisations beyond the academy' (p. 14)

Source: Expert Panel, 2017.

The evaluation panel in CEMPE's case treated the innovations largely in combination and its observations regarding successes in implementation partly overlap. Similarly, its observations about challenges applied across the separate areas of activity: a more strategic outlook, more attention to dissemination beyond the music academy itself (to other music schools in Norway and to peer-conservatoires in Europe), and more engagement with students and stakeholders (Expert Panel, 2017, pp. 15–16).

In its application form, MatRIC listed its impact in terms of the characteristics that students would have due to 'effective mathematics teaching and learning', though it was not made clear whether and to what extent these characteristics might differ from other mathematics students. Also, it claimed to achieve impacts on mathematics teaching ('raise significantly') and on recruitment to STEM occupations. Its activities listed under the four work packages included some with dissemination aspects integrated since the first work package was meant to establish networks among teachers and users, as well as some dedicated dissemination activities to raise awareness and knowledge beyond the MatRIC members.

The evaluation panel judged that it 'had made good progress on a number of these aims' during its first phase – though the detailed judgements were toned more positively (Table 4), except for the research aim, where the quantifier 'some' seemed to indicate less than full satisfaction of the evaluators because the connection between educational innovation and the research undertaken was weak (Expert Panel, 2017, p. 25). To some extent, this somewhat reserved judgment may also have come about through 'a lack of evidence' about the impact (Expert Panel, 2017, p. 22).[5]

The detailed observations also showed that there were many more concrete innovations below the level of the general work areas, such as introducing flipped classrooms in the focus area heading of 'resources'.

[5] This was in fact a problem for all SFUs: 'most of the evidence the Centres have is related to how many activities they have run rather than about the impact these activities have had on the practices and outcomes of teachers and students' (Expert Panel, 2017, p. 28).

This example also shows that innovation even in SFUs may be local innovation making use of approaches developed elsewhere.

Table 4 Activities and interim evaluation MatRIC

'Innovation' / Work area	Evaluation judgment
Networking mathematics teachers	'The Centre had set up good national networks of mathematics teachers … The international networks of the Centre were also impressive' (p. 20)
Conducting research into innovation in the teaching and learning of mathematics	'conducted some useful research into the teaching and learning of mathematics' (p. 20)
Developing teaching resources that simulate workplace applications of mathematics	'students and teaching staff, as well as the national stakeholders, that the panel talked to were very positive about the work of the Centre and clearly felt it had supported their engagement with mathematics education. Students were positive about the innovations, such as the flipped classroom, that the Centre had supported. The Centre had developed a number of useful resources including those on MatRIC TV' (p. 20)
Support mathematical modelling and disseminating research and innovation in mathematics teaching	'had made good progress in disseminating their work' (p. 20)

Source: Expert Panel, 2017.

As the judgment about the first focus area shows, MatRIC 'was more successful nationally and internationally' than locally (Expert Panel, 2017, p. 27). However, the local impact was promised at the interim evaluation: 'The senior leadership clearly stated that the Centre will play an important role in future institutional development of teaching and learning and were very committed to the future development of the Centre' (Expert Panel, 2017, p. 21). Subsequent annual reports showed that MatRIC indeed became increasingly involved in its host university's innovation in education (e.g. MatRIC, 2019, p. 6).

The evaluators believed that MatRIC was working mainly with early adopters ('the enthusiasts') and that it needed to strengthen its national network by appointing designated contact persons in each higher education institution in the country (Expert Panel, 2017, p. 22, 24–25), apparently to gain more dissemination of its innovations beyond the early adopters. The evaluators' advice influenced MatRIC in the following years and, for instance, in 2018 it 'has been successful in becoming more tightly woven into the fabric of Norwegian Higher Education, thus enabling MatRIC to be more effective in influencing and shaping both policy and practice' (MatRIC, 2019, p. 1). This is a statement of intermediate effects, creating conditions for impact on 'policy and practice', as it says, in later years.

Two sections in MatRIC's most recent annual report focuses on impact and are titled: 'Activities/projects have had the desired results!' and 'Activities/projects that have not had the desired results and the lessons learned' (MatRIC, 2019, p. 6). Qualitatively, the centre portrayed in these sections its impressions about becoming a more central node in national and local networks (see above), but also related how, based on negative feedback from external employer stakeholders, it stopped certain parts of its activities.

4.2 Recent SFUs

CCSE intended to transform science education by integrating computing into it (source: CCSE application form). Besides four main areas of activity (see Table 5), it addressed dissemination in a cross-cutting, fifth work package. Apart from making materials and methods available an raising awareness and knowledge about them for a broad audience through all channels (online, social media, books, articles, conferences,

workshops), dissemination plans included intensive contacts with other departments in the host university—including collaboration with another SFU, ProTed—as well as unspecified 'Transition mechanisms [that] will be developed through a pilot' to another university. The Centre is aware that innovative education 'methods are scarcely applied and often quickly discontinued if applied. Thus, we need to go beyond dissemination' though according to the application materials, the further activities seem to rely on gaining information about retention rather than ensuring it. As computer scientists befits, the feedback mechanisms are expected to include big data learning analytics. In the most recent annual report, it becomes clear that CCSE has drawn in a preferred partner, by contracting another Norwegian university for dissemination (CCSE, 2019, p. 6).

Table 5 Innovation potential CCSE

Work package	Innovation potential	Dissemination and impact to date
Research-based development of teaching material	High: focus on didactics/work forms; low/medium modification needed; low/medium costs; well-defined, well-understood target group; low degree of cooperation needed	We are actively teaching student-active teaching methods and are building a portfolio of courses in computational methods for teachers and faculty.
Research-based development of methods and approaches	Medium/high: focus on didactics/work forms/curriculum; medium modification needed; medium costs; well-defined, well-understood target group; high degree of cooperation needed. Joint development with target group planned.	integration of programming has been extended to many bachelor programs [at host university + preferred partner]; contacts have been made with more bachelor programs [at host university]. In particular: 'Dissemination to the biosciences bachelor program has been a particular success. Here we see broad adaptation [=adoption?]' (p. 8) 'Computing and programming is also a key element in the new honours-programme developed at UiO, which will build a basis for further disseminiation [sic]' (p. 8)
Develop a culture for teaching and learning	Medium: focus on curriculum/structures/ideas; medium/high modification needed; medium costs; well-defined target group including students; high degree of cooperation needed. Joint development with target group planned.	CCSE personnel is contributing to workshops, seminars, courses and retreats A national decision was taken to integrate programming into mathematics education in schools. We have been part of developing the new curricular guidelines
Student-driven activities	Medium: focus on structures; medium/high modification needed; low/medium costs; well-defined target group of students; high degree of cooperation needed. Joint development with target group planned.	A grant for student research projects

Source: CCSE, 2019

The approach that CCSE takes in its annual report of 2018 shows explicit attention to dissemination, impact and adaptation to opportunities, such as the rising importance of computing in the secondary education curriculum (CCSE, 2019, p. 9). Among the lessons learnt is that the cultural context matters to adopting innovations: 'we have found that methods for student active learning that have been developed in the US may not be directly transferrable to a European context where participation in teaching activities is largely voluntary' (CCSE, 2019, p. 9).

CEFIMA's aim is to innovate artistic content creation in visual media education. Its work packages are listed below (Table 6).[6] There is an additional work package on the 'Multiple strategies of dissemination', which include raising *awareness* and sharing *knowledge* through several channels. Collaboration in new, extended and existing networks of visual academies and designers seems to be the core of dissemination, however. Also, the main method of working in the SFU, through temporary 'clusters', is intended to merge development, collaboration and dissemination. The dissemination section in the application form does not mention *impact* on behaviour of teachers or students, although in a few places, feedback from students and other stakeholders is mentioned.

Table 6 Innovation potential CEFIMA

Work package	Innovation potential	Dissemination and impact to date
Enhance teaching and learning in filmmaking and digital media by integrating new, digital elements	Medium/High: focus on didactics/work forms; low/medium modification needed; medium/high costs; well-defined, well-understood target group; high degree of cooperation needed	'Artistic Research Café, … [a] monthly series of talks and presentations' (p. 6)
Develop new programmes in immersive and interactive digital media storytelling	High: focus on didactics/work forms; medium modification needed; medium costs; well-defined, well-understood target group; low degree of cooperation needed.	Contributed to curriculum review at the higher education institution 'earlier than anticipated' because the opportunity arose. 'Early evaluations from students, and feedback from collaborators like NRK and from the film industry have been very positive' (p. 7)
Develop a teacher-training programme aimed at artists and professional practitioners to prepare them for teaching and learning that includes the above	Medium: focus on didactics/work forms/curriculum; medium/high modification needed; medium costs; well-defined target, well-understood target group; high degree of cooperation needed.	A course was developed, and formally introduced in 2018/19.
Implement Artistic Research at all levels into the Art of Immersive and Interactive Storytelling	Medium: focus on idea/didactics?; medium modification needed; low/medium costs; well-defined target group; high degree of cooperation needed.	'primarily through the work of the PhDs in Artistic Research. Their competencies and projects have already had an impact on both the MFA and BFA programmes' (p. 2) A semester-long workshop was held: 'It is no exaggeration to say no other film school in the world has undertaken a similar project, and this has made both the school and the Centre interesting to a new constituency' (p. 4) + two other projects

Source: CEFIMA, 2019

The Engage SFU also works in five packages: three on entrepreneurial attitudes and skills, while on this basis 'WP4 develops tools for transforming teaching in all disciplines and professions towards a more action- and practice-based approach' and 'WP5 documents the activities in the other WPs, measures their learning effects and disseminates them' (source: application form). Accordingly, actual innovations should emerge from the first three work packages, and become disseminated and impactful through the other two work packages.

[6] The annual report of CEFIMA does not explicitly follow the logic of the work packages. Activities, dissemination and impact in Table 6 have been distributed to the location where they seemed to suit best.

In the first pages of its most recent annual report, Engage starts with its early-phase achievements by the two most-involved institutions (Engage, 2019, p. 2). This shows that while it may be early for the centre to have created impact, it is already aware that impact is the 'bottom line'. Accordingly, 'To further evaluate our progress, we have strict follow-ups on every initiative according to the theme, purpose, pedagogical approach, reach and intended effect' (Engage, 2019, p. 50). Engage reports its activities and impact not by work packages, but by target group (students, educators) and type of activity (research), which makes it less straightforward to connect activities to work packages (see Table 7).

Table 7 Innovation potential of Engage

Work package	Innovation potential	Dissemination and impact to date
Developing collaborative skills in interdisciplinary teams	High: focus on didactics/work forms; low/medium modification needed; low costs; well-defined target group of students; high degree of cooperation needed	Students: 'developed and launched over 80 new student-driven experience-based entrepreneurship education initiatives, reaching more than 2000 students in all the major disciplines at the higher education level, in the local, national and international level' (p. 50) Impact on students: 'surveys… to explore the extent to which the initiatives made the students feel engaged and the extent to which the students felt that they mastered challenging tasks' (p. 50) 'Importantly, two years after the foundation of Engage, NTNU School of Entrepreneurship is, by Studiebarometeret, ranked as the most inspiring, challenging, motivating and stimulating master degree program within the natural sciences and technology in Norway' (p. 15)
Venture creation methods in a research setting (design thinking, rapid prototyping)	High: focus on didactics/work forms/curriculum; medium modification needed; low/medium costs; well-defined target group; high degree of cooperation needed.	
Development of venture creation programs	High: focus on didactics/work forms/curriculum; low/medium modification needed; low/medium costs; well-defined target group; high degree of cooperation needed.	Educators: 'To broaden the impact, we have established collaboration with educators at diverse disciplines and developed new initiatives to engage education at NTNU and Nord, but also across Europe and North America' (p. 50)
Increase the number of students in higher education with entrepreneurial mind-sets and skills through new teaching methods in entrepreneurship education, teamwork courses and product development in different study programs	Low/medium: focus on didactics/work forms/curriculum; medium/high modification needed; low/medium costs; broad target group of Norwegian higher education institutions; high degree of cooperation needed.	
Documentation, research and dissemination of knowledge	[not applicable]	Research: 'We have reached the international research community through workshop[s], seminars, conferences and publications' (p. 50)

Source: Engage, 2019

Apart from the activities listed and illustrated in the annual report, and which are summarised in the table above, Engage reports on early impact measurements among students.

The eighth SFU, ExcITEd, like the previous one, is a collaborative centre between NTNU and Nord University. It organised its activities around five 'projects' (source: application form). It is focused on its activities to the two partner universities. Next to the five content-related work packages, dissemination activities were listed in the application. The centre's main approach for engaging teachers outside the core team has been so-called "mini-projects", where a faculty member (or several in collaboration) can apply for a small sum of money (typical amount 50 KNOK [circa € 5,000]). The idea is to help the faculty member(s) try out educational interventions' (ExcITEd, 2018, p. [4]).

Table 8 Innovation potential ExcITEd

Work package	Innovation potential	Dissemination and impact to date
P1: "Informed decision": increase the knowledge of IT and the IT profession for pre- university students	Medium: focus on ideas (attitudes); medium modification needed; medium costs; well-defined, target group; high degree of cooperation needed	Continued IT-teaching for secondary school teachers; plus new: networking with school; 'ambassadors' to visit schools
P2: "Projects of Becoming": support first-year students	High: focus on didactics/work forms/curriculum; low/medium modification needed; low costs; well-defined, local target group; high degree of cooperation needed.	Expand and exchange within NTNU+Nord social and active learning; support at-risk students
P3: "Learning through Construction": students' interest and excitement by creative design of IT artefacts	High: focus on didactics/work forms/curriculum; low/medium modification needed; low/medium costs; well-defined, local target group; medium degree of cooperation needed.	Create a community of practice; integrate learning through construction in curriculum
P4: "Sharing and Diversity": cross-campus learning spaces	High: focus on didactics/work forms; low/medium modification needed; low/medium costs; well-defined local target group; medium degree of cooperation needed.	monitor best practice project-based teaching from other IT educations world-wide, as well as the expected competences from the IT industry
P5: "Career Readiness": "real-life industry-driven" learning	High: focus on didactics/work forms; low/medium modification needed; low/medium costs; well-defined local target group; medium degree of cooperation needed.	Expand internships into "students-industry hubs" based on industry-agreed *minimum viable competence* for IT-related summer jobs

Source: ExcITEd, 2018

The outcomes the ExcITEd defined in its application form for each of the projects were all in terms of un-specified increases ('more popular', 'contribute to', 'increase', 'strengthen') and amounts ('a number of tools'). Next to the five content-related work packages, dissemination activities were listed in the application. The applicants intended to 'develop detailed roadmaps for our dissemination strategy and activities in each of the projects' at the start of ExcITEd's existence, systematically along the lines of dissemination for awareness, for understanding and for action. Awareness-raising was to be addressed through publications (paper and online, scientific and popularising) and conference attendance in Norway. Understanding would be disseminated through workshops for IT teachers, and through student-'ambassadors' to make propaganda in schools. Concerning dissemination for use and action, a national community of practice would develop, spread and embed project outcomes in the form of openly available, high-quality learning resources. Internationally, expanded networking activity was foreseen.

ExcITEd aimed to measure the impact on students of the two collaborating universities. In the first year of ExcITEd's existence, 'Monitoring of impact […] has not been in focus since it was necessary to identify the baseline before monitoring is possible' (ExcITEd, 2018, p. [8]).

4.3 Conclusion

All SFU applications include texts on results or impacts to be attained; none are formulated in SMART (Specific, Measurable, Assignable, Realistic and Time-related)[7] terms, however. They are only in some

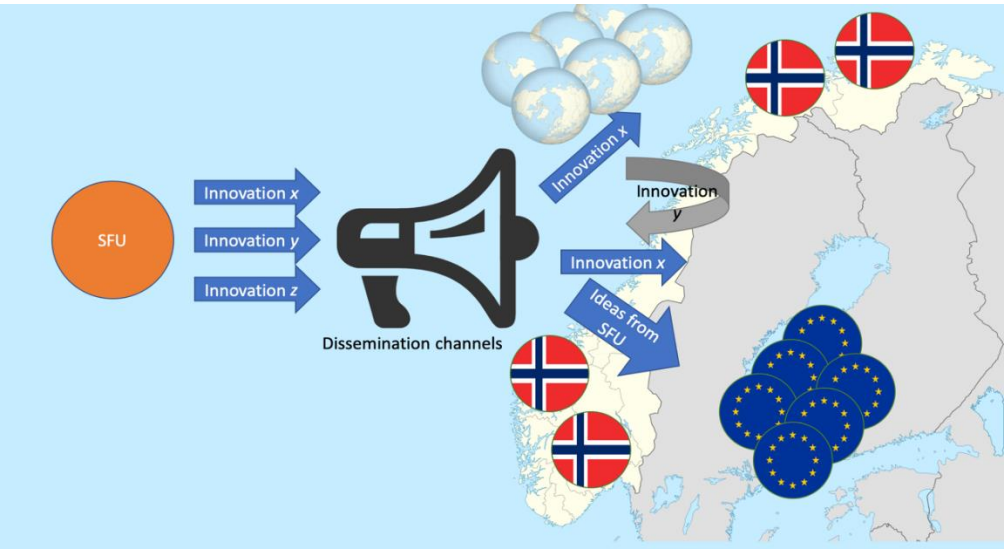
[7] Alternatively, SMART may be taken to mean: Specific, Measurable, *Achievable, Relevant* and Time-bound.

cases connected directly to the different work packages (good example: ExcITEd). Activities to achieve impacts are mostly reported according to the work packages.

Interim evaluations of ProTed and BioCEED and several annual reports (e.g. of CEFIMA) showed that the cross-activity nature of dissemination as it was described in the application documents, may have made it difficult for the SFU to keep focus in the dissemination of particular innovations (NOKUT, 2015). Yet, it may have led to more and unanticipated impact for ProTed (the university schools became a national practice in teacher education) and for bioCEED (its model for evaluation and reward of teaching staff became a national norm). Unanticipated broad impact was also found in MatRIC, which seemed to figure as an inspiration for educational innovation across its whole host university. Making use of opportunities seems an important part of dissemination and achieving impact, also, e.g. in the case of CEFIMA: a centre's capacities may be put to good use in unanticipated situations.

At the same time, we must remember that ProTed initiated a large number of small research projects (NOKUT, 2015), while bioCEED intended to affect the institutional education culture so that targeted innovations were not continually in the focus of these SFUs. This emphasises that the model of innovation → dissemination → impact should not be taken too linear, either. Figure 3 below depicts a more realistic model: an SFU may develop several ideas, some of which can be identified as innovations. Intended dissemination may occur through several channels (web, social media, scientific journals, popular magazines, online of face-to-face workshops, conferences, interviews, etc.) which may cut across several ideas and innovations, and then it depends on the recipients what they take up: some innovations make it, some are rejected, some are not even perceived, while more general ideas from or about the SFUs may impact some other recipients. Depending on the dissemination channel, however, recipients may be Norwegian (own university and others), Scandinavian, European or worldwide. A more strategic choice of dissemination channels repeatedly appeared among the evaluative remarks; also, more intense, targeted engagement with (potential) stakeholders such as students, the profession and employers rather than abstract, broadcasting forms of dissemination were on the wish list of evaluators (e.g. for CEMPE).

Figure 3 Non-linear dissemination model for SFUs



In conclusion, we may repeat that with regard to dissemination of innovation, we are working on 'spørsmål om ringvirkninger av et uklart begrep og en uklar målbarhet' [questions about the ripple effects of an unclear concept and an unclear measurability] (Carlsten & Vabø, 2015, p. 22). The expert panel that made the interim evaluations of BioCEED, CEMPE and MatRIC wished that the SFUs would work to minimise the unclarity and develop—together with NOKUT—a concrete theory of change: 'all of the Centres would benefit from developing more explicit models for disseminating the innovative outcomes of their activities. Crucially, these should focus on how they expect their approach to dissemination to lead to changes in the educational practices…' (Expert Panel, 2017, p. 28).

Nevertheless, annual reports of most SFUs continue to list activities and outputs rather than effected changes and other impacts; the Engage report has an exceptional focus on effects of curriculum renewal on student learning (Engage, 2019, p. 50). Interestingly, in the most recent CEMPE annual report, an interview with the centre's leader is used as a sort of summary of the year and one question addresses impacts, which shows that the subject is on the agenda of the SFU; however, in this form of reporting, impact is illustrated through impressions rather than through evidence (CEMPE, 2019, p. 11–12).

Admittedly, it is hard to give evidence in other than subjective, judgmental statements regarding artistic performance and maybe from CEMPE we cannot expect proof beyond statements such as: 'The project has made an impact on the students' work, as they have reached a higher level artistically' (CEMPE, 2019, p. 25). In other cases, even with the goodwill of e.g. MatRIC to report impact, it may still be too early, as in a curriculum adaptation: 'The response from students has been very positive and we are looking forward to evidence of impact at the conclusion of the regular mathematics course in the late spring' (MatRIC, 2019, p. 6), or PhD theses to be finalised in the coming years.

5. Scoping interviews

The scoping interview study phase is included to collect data with regard to the three major questions guiding the study. Its main purpose for this report is to learn how the SFU scheme and its management are perceived in the Norwegian higher education system. Methodically, they inform the construction of the questionnaire for the survey in the next study phase. The scoping interviews were held – with one exception – face-to-face and all recordings were fully transcribed except where the quality of the audio did not allow it (one interview; manual notes were used). Respondents include four groups of interviewees: representatives of the SFUs, representatives of NOKUT, representatives from other higher education institutions interested in but without a current SFU, and other stakeholders as well as experts on higher education in Norway.

In this section, we report the main findings from the scoping interviews concerning the research questions, structured in an inductive manner, following topics that emerged from the interviews. Interview schedules and a list of interviewees in the scoping interview are included as Annexes 2 and 3.

5.1 Dissemination and Adoption of SFU innovations

Innovations and impact

On the question of dissemination of SFUs' innovations, most observations were made by interviewees from within the SFUs—after all, they are the potential 'senders' of innovation into the higher education system. And they had been selected for a clear focus on creating impact for their SFU proposal. An interviewee involved in the selection process of some SFUs made that clear: 'We were looking for centres that were seeking to have a big impact […] beyond their own institutions' (interview L:01):[8] they had to 'think big' and show potential to turn that vision into reality, but 'in the first round … in a lot of the bids that section [on dissemination] was very tame' (interview L:01). In subsequent rounds, both in the instructions for submissions and in the selection process, creating impact was given a prominent place.

But some interviewees, first of all, asked the fundamental question of what it is they can contribute to the higher education system. What is an innovation? 'it's difficult to kind of pinpoint the threshold for the concept of innovation' (interview 6:50) Dissemination can also concern less concrete 'innovations' but more general 'educational philosophies': 'not an innovation, but a focus, a general idea, that is disseminated also now' (interview 6:52) – in this case: student-centred education, as a new way of conceptualising local and disciplinary practices which were traditionally already fairly student-centred, but unconsciously so.

Implicitly, another respondent questioned the idea of innovation moving from an SFU to the broader higher education institution, because she maintained that in fact here had been a fusion of the SFU with the departmental unit in which it had been started: 'I think the boundaries of those two things are gone.

[8] Interviews are referenced by a number or letter plus a figure indicating the paragraph or time into the interview from which the quote was taken.

Simply because of the chemistry of the people working in the project' (interview P:08). The integration of the SFU into its surrounding higher education institution is institutionalized in this case through a 'personal union' of the unit's manager also becoming the manager of the SFU. On the other hand, it as remarked that 'there is always the challenge of having these centers. They are sort of a little bit on the side of the … organizational structure in the institutions. I mean this is, this goes for centers of excellence of all kinds' (interview 11:26').

Finally, gaining SFU status is not the only way to stimulate educational innovation: 'even the proposals that didn't win, we would still use that as a starting point for further work' (interview 11:07').

Dissemination at different scales

SFUs were expected to strive for impact at different scales or levels in the system of higher education: local, national and international. They were not all equally active at all three scales: 'certainly CEMPE and Bioceed, and Matric as well had strong international reputations and went into very strong international networks for education in their particular disciplinary areas and you could see that they were making meaningful contributions … The centres found it more difficult to have an impact across Norway. I think partly because they already have established international networks… How to do … [national dissemination in] an inclusive way seemed to be less obvious to them … and having that kind of impact … in a sustained way is incredibly difficult' (interview A:03); 'the local and the international from our perspective looked fine; it was the national level that seemed to be the real struggle' (interview A:29; similar: interview C:2).

Dissemination to whom? Types of users

From the interviewees who were not actually in SFUs, we gained one important insight into the nature of potential users, to wit that some are more innovation-prone than others: innovation '… is also a question of the people that are interested in developing their education regardless [of where the ideas come from]' (interview 10:22).

An external observer warned against wanting to see too much impact of SFUs: while participants in the SFU programme might exhibit much effort to develop innovations and to disseminate them, the potential users might not have the SFUs very high on their attention lists—if they were interested in educational innovation in the first place (interview B).

Dissemination process – the importance of networks

SFU respondents made clear that the dissemination process requires time—the project structure of two five-year periods shows awareness of that: '… if you try to disseminate too much too early, before you have any results, you will spend a lot of time making sort of fluffy presentations' (interview 4:28). In our study, this is reflected in the different perspectives we take of the 'old' and the 'new' SFUs.

Moreover, active dissemination of specific experiences is not always an explicit goal: 'it is not the wisest thing and even not the most fruitful to have this institution disseminating in the sense of "you should do like us". It is more important to find ways to collaborate and building strengths in other institutions in Norway. And we have done that in a number of ways' (interview 6:53) Similarly: 'We have this expression in Norwegian: [speaks Norwegian], "don't come here and tell me what to do because I know what I'm

doing" … So it's easier for us to tell other countries about what to do than it is to tell our neighbours what to do' (interview P:44).

Nevertheless, SFUs can play a leading role: '… one main challenge is digital learning and online content and so on. And all institutions understand that those issues have to be worked on collaboratively… And they have said that we would like … [the SFU] to be leading that process. And … as I understand it is because they trust us' (interview 6:53) The latter remark points to the mechanism of dissemination: it is a social process in which not only the message (the innovation) but also trust in the messenger (the SFU) plays a role, which is a characteristic of the network in which the unit that organises the SFU is embedded. The collaborative, social and potentially network-related character of the SFU initiative is also pointed out by the following response: 'this is really not a competition. It's about everyone getting better' (interview 11:23).

Networks have been quite strong in, especially, the STEM area, where they have also been supported by national bodies like the UHR (interview 11:13').

However, networks are not automatically emerging, and both NOKUT and e.g. the UHR either established new networks for SFUs or integrated SFU-activities in existing networks (interview 11). Nor are they automatically effective. The NOKUT network among the SFUs led a respondent to remark that: 'We haven't had too much collaboration. I must admit to my regret, because obviously we could have had interesting collaboration with almost all the other SFUs in some way…' (interview 4:28). If there is evident synergy, collaboration among develops, though: 'It's just a great SFU. And we work together with them because what they do is important for [our SFU]' (interview P:19'; similar in interview 11).

A different dissemination process is the road through national policy, spurred by the evaluators in the mid-term review of this SFU: 'this one sentence that came in the evaluation that said that we have [a certain innovation] … we're the first ones to start [it] … and we continue to do a really good job with that compared to all the other institutions. Now that's become a part of the national documents and everyone has to do that…. it isn't an innovation anymore. It's a legacy.' (interview P:06).

Contextuality of education innovation?

Both innovation and dissemination are highly context-dependent processes: 'It's not interesting for the other universities. So we have … a hard time getting in. … because they're trying to find their own way in their own innovations […] I don't think NOKUT can help us here. I think it's just something each subject area has to figure out how their colleagues can learn from them' (interview P:44'/48'). On the other hand: many education innovations 'are not that specific to the discipline' (interview 11:18')

Information channels

The scoping interviews provided a little bit of information on the effectiveness of specific information channels. One of the SFU respondents was positive about the traditional means of communication through a physical newsletter or magazine: '…this SFU magazine … has been a nice outlet to disseminate what we are doing and also to follow what other SFUs are doing. And … one easy way for us to disseminate … by just sharing around some copies of this SFU magazine and putting it in the lunchrooms and things like that.' (interview 4:30) '… and people will just occasionally pick it up and read something they wouldn't have been reading otherwise' (interview 4:31). The magazine also reaches observers outside the higher education institutions, such as the Ministry of Education (interview 5:35').

Others were more skeptical of the benefits of a dedicated popular magazine: 'We don't need that magazine to do that', because 'we have an open source [platform]' (interview P:29:32/02). And innovations are also spread using traditional academic information channels: 'the regular scholarly articles in journals and so on' (interview 6:58).

Limitation of interviews among SFUs

A limitation of the scoping interviews—hence the need for a survey among the rest of the higher education system—was highlighted when one of the SFU respondents admitted to gaining limited feedback about success of dissemination: '… the impact of that is … not reported back to us. That's kind of hard for us to say whether or not this has resulted in something concrete…' (interview 3:25)

5.2 Evaluating NOKUT's role in the management of the SFU

Preparation of SFU scheme and centres

NOKUT's framework for the SFU scheme was prepared well, making use of international experiences, such as those in other Scandinavian countries or in the UK. With positive results, according to an international observer: 'The way the SFU works is one of the best I know of in terms of the way in which it works on excellence' (interview A).

Much preparation is also required from the universities: 'It costs a lot to have such a center for 10 years... *Researcher*: To get the regulation you mean? *Interviewees*: To build it up! So it's important that it's within an area that you are interested in strategically' (interview 11:25'). This suggests that guidance by the national coordinator of universities about their commitment when they intend to prepare an SFU application might be helpful in overcoming potential hindrances.

Flexibility and guidance of SFUs

The interviewees in SFUs were on the whole very satisfied with NOKUT's supportive manner (interview C:3) of managing the SFU scheme: 'NOKUT has been great. Really. […] They have always shown up for our board meetings as observers and given lots of relevant input there. And also whenever we have had questions by email or in other ways. And also they have had held some useful gatherings of all the SFUs and sometimes with international experts speaking about various topics like evaluation of impact and things like that, which have been very useful' (interview 4:30). Which resulted from a combination of a well-designed framework ('there's a rich understanding of partnership and working together', 'the way in which the SFU was operationalized really encouraged them to take risks') but also of highly dedicated staff members: 'that actually established the trust and a way of working that … transcended the limitations of … [their] approach. The way in which NOKUT supported the centers in developing what they were doing I think led to some impressive enhancement activities' (interview A:13/19/09). 'NOKUT was very good at framing' to keep the conversation with the SFUs focused on their achieving quality enhancement (interview A:24).

Another respondent preferred project management to keep its distance: 'I think it's important that the institutions and the universities … have more responsibility and perhaps because NOKUT just tried to have too much responsibility […] But I understand that also because it's new and they want to do a good job and they're so dedicated' (interview P:40). Finding the right balance in each case between being

supportive and light-touch programme management may be difficult; it requires tailor-made relationships with each SFU. NOKUT apparently invested much into gaining detailed knowledge about each SFU to make such a tailor-made approach possible.

Stimulating the network among SFUs was a positive element: 'It's important to be a family and NOKUT tries to get us together a lot' (interview P:22). This was a conscious strategy by NOKUT, taken as a lesson from the British CELT-example that they investigated at the initiation of the SFU programme. In contrast to the UK examples, the SFU should be a coherent whole, 'they need to see themselves as part of something bigger' (interview L:27), which aids inter-disciplinary dissemination, even if that sometimes requires the abstract task of recognising 'some sort of meta properties' (interview L:27).

Asking specifically about improvement potential, the formal side of the process received some critical remarks. In contrast with the appreciation for flexibility in day-to-day management, for the paperwork the same interviewee would have liked clearer, stricter, guidance: 'they could maybe have had clearer templates for the annual report, for instance, because we and many other centres have been uncertain what to include…' (interview 4:30). The same was said about the lack of budget templates (interview P:24:43). The contrary opinion was voiced too: a respondent was happy that the SFU could use its own structure as long as the necessary elements were covered somehow (interview C:2), while another thought that NOKUT is 'control oriented as an institution' so there is room for streamlining although 'in general they've done very good job' (interview 11:41'/42').

The experiences with the interim evaluation depended very much on the position of the interviewee: evaluators 'wanted to have a very much enhancement-focused evaluation […] we had a real struggle moving them from reporting activities to thinking about the exact extent to which they would achieve their aims' (interview A:03/19], while 'Clearly for the centres … those discussions around enhancements … [were] much more stressful … because this could mean … "we're not going to get the money" ' (interview A:03). Indeed, the interim evaluations led to anxiety: 'it was a lot of work. Very few people. It was really stressful' (interview 6:66; also interview 11:39').

NOKUT's position: many roles simultaneously?

One respondent saw a structural issue with NOKUT's position as a quality enhancer through the SFU scheme while also being the auditor and controller of quality management in the higher education institutions (interviews P:23; 5:17'). Role conflict is always a danger for policy coordinators. While the coping interviews were meant to gain insight into the range of issues to be investigated further rather than give quantitatively representative insights, still it may be remarkable that NOKUT's roles were tables only once.

NOKUT's learning over the years – funding level

The SFU scheme was seen as a 'flagship project' for NOKUT and for instance the Ministry of Education and Research monitored developments closely at first because it wanted a good start, but it soon trusted that NOKUT did a good job (interview 5:19').

A respondent from an earlier SFU found that the more recent SFUs were funded at a higher level, and deplored that there was no way to adjust the old SFUs' funding levels: 'you're just kind of hanging in there in your institute and you don't have the capacity then to hire enough people to do things with your institute ['like communication']. You're always asking your institute for funding … and you don't get to be

powerful then to implement change' (interview P:15). The importance of the home university's funds leads to potential mission drift of the SFU: 'it all has to do with what the institution then wants to do and not so much what [the SFU] … wants to do' (interview P:18). This remark comes back to the question how much the local university may be expected to invest in in an SFU —and to what extent shared funding between national and local sources incites role conflicts for the Centre. According to this respondent, the balance changed over the years and later SFUs were funded better from national sources, making them more secure with regard to disseminating their achievements and ideas than the early ones.

Life cycle of an SFU: different aims before and after mid-term

Some respondents may not have been fully aware of the idea of a lifecycle of an SFU during the whole process, because 'We saw that some [criteria] became more important to the site visit which wasn't clearly stated in the [SFU] call.' (interview 4:30). Yet even if respondents were aware of the different phases, challenges remained. In one of the more mature SFUs, the mid-term evaluation was the occasion to shift gears to the second five year period: 'you have to do two things at the same time in the last five years: you have to find out how all the innovations you've been working with are going to become a part of the regular drift of the rest of your university. But at the same time, you don't want to give up on continuing to do innovative things' (interview P:05). This was also seen as a challenge by external partners in the process: 'my sense was that phase 1 of being an SFU was very much [about] getting things running … If you're having phase two then this needs to be more strategic and … the three centers [that I helped evaluate] were surprised about how strategic we wanted them to be' (interview A:03).

Some observers noted the danger of having centres for excellent education as separate units next to, e.g., research centres. This observer argued: 'instead of growing into very separate pillars these should be integrated' (interview 11:28').

Dissemination networks: Broad and narrow disciplinary scope of SFUs

Some interviewees indicated that the networks through which their dissemination takes place may be predicated on the social organisation of academic disciplines: 'What we have been working on is finding ways to collaborate with our *sister institutions'* (interview 6:53; emphasis added). And similarly: '… we have also learned that you can't just take it from mathematics and transfer it to history, for example. There are different ways of teaching and learning' (interview 5:76). However, others maintain that in their SFU: 'There is nothing [disciplinary] … specific about that really. You could do it in the bachelor in chemistry or philosophy or anything else. So of course, it would be very relevant to try to disseminate that widely… that's something we haven't done that much, … we could obviously do more of it… But we also participate in the M&T conference which is for all kinds of STEM education.' (interview 4:25) And five of the eight SFUs are in the STEM area (interview 11:01').

A respondent with a good overview of SFUs adds: 'Bioceed is a good example of one that I'm really happy [with]. Because we can transfer a lot of that information to science and math faculties throughout the country and internationally as well. So they're a great example. There are other examples that are very narrow' (interview P:14).

The concentration of a number of SFUs in the broad STEM area was stimulated by the UHR (interview 11:04').

SFU and institutional prestige

The dual character of SFUs as centres that should invent innovations during their lifetime, but that only can get the coveted SFU status if they are already (at least locally) known to be excellent in education at the outset is shown here: 'our deputy director at … [the university] and the director for innovation … thought what we were doing was so interesting and they strongly encouraged us to apply. We have gotten a lot of encouragement from the … [university] central' (interview 9:15); 'it's really gained momentum as an arena' (interview 11:55'). Building local strengths into national ones adds to the prestige of the host university, adding an element of extrinsic motivation into the SFU scheme.

The possibility to gain significant additional funding also motivated universities to get SFUs: 'I do not know any other places where you can get funding … [for this purpose]. There are not a lot of other options, to be frank. So, that was a huge incentive' (interview 9:15)

5.3 Conclusions from scoping Interviews

The scoping interviews confirmed the situation as laid down in the evaluation project call, especially the importance for the SFU scheme of creating impact beyond each SFU and its host university. Also, they showed that NOKUT, in its instructions for submissions, became more sophisticated with regard to creating impact after the first experiences. Enhancement of teaching and learning was shown to be a collaborative process, not a competition, even though all innovation needs adaptation to its local context instead of one-size-fits-all adoption. Co-creation of innovation is, in that view, close to the core of any diffusion model.

Partly as a consequence of the contextuality of teaching and learning, we must be aware that neither the border between an SFU and its host institution, nor the border between good practices and innovations, are always very clear—and that this fluidity need not be negative. Moreover, participants may not always be well-informed about the influence they may have on others, as feedback about adoption of innovative ideas does not always come forward. Unsurprisingly, not all respondents outside the SFUs were aware of concrete innovations that had come out of the eight very different centres.

Adoption of innovation further depends on the recipients, who may exhibit different levels of readiness for innovation, and who may not be very informed about the SFUs' potential contributions.

NOKUT has succeeded in creating the programme level as an active network for mutual learning among SFUs and as a basis for dissemination beyond the separate SFUs.

The communication channels used for dissemination of SFUs' ideas may differ for different audiences (paper magazines for local dissemination for information, scientific journals for informing disciplinary peers further afield, network meetings, etc.).

Ministry representatives, from their system-level view emphasized the importance of the success of the SFU scheme for the whole of Norwegian higher education: 'It's really important, it was a locomotive for all the quality initiatives we are having now' (interview 5:50').

The idea of a good programme manager was viewed differently by different participants; elements for further steps in our research should therefore include the balance between flexibility and uniformity through templates and guidelines, the balance between being supportive and respecting SFUs' autonomy, the mid-term evaluations, and the different life cycle phases of SFUs.

6. Survey among Staff at Norwegian Universities

6.1 Survey Topics and Survey Methodology

In order to learn about the impact of the SFU scheme, i.e. to what extent it reached out to staff at the Norwegian Higher Education institutions and to what extent the staff integrated the achievements of the SFU in their educational activities, a survey was done during the summer of 2019.

The survey started from the background of the respondents, the importance of educational enhancement in their institution and their education involvement. Further, the survey asked the respondents if they are aware of the SFU initiative, and if so, how they learned about the SFUs, how relevant they are to them and how they rate SFU achievement when comparing them to those of other educational enhancement initiatives. Respondents also provided information on if their actual use of the SFU achievements and factors facilitate their uptake.

The survey was implemented as an online survey using the "Qualtrics®" software. Access to this portal was provided by the University of Twente. The gross sample was drawn from the websites of Norwegian higher education institutions that provided easy access to their staff email-addresses and mentioning their professional role. Easy access means that we were able to collect email addresses through web scraping or just copying from the websites. Some Norwegian institutions protected the email addresses of their staff against scraping and copying, these were not included in the survey. The survey also only addressed higher education institutions that were accredited by NOKUT in the summer of 2019.

The survey was not sent to all collected email addresses. Rather, for each institution staff that clearly did not have a role in education (such as cleaning personnel, facility managers, or financial advisors) were deleted from the database. Further, a 75%-sample was drawn randomly from the remaining addresses. This sample was split into three waves. Waves were mailed in irregular intervals between June and August 2019. We invited each respondent only once. There were no further reminders. During the survey period, invitees were able to contact CHEPS for their questions.

In total, we sent out 19,625 emails. From these 198 emails did not reach out to staff, either because the email-address was not correct, it was a duplicate address or bounced back. Table 1 lists the detailed numbers for each institution we were able to include in the survey. The total response rate amounts to 7%. This response is rather high compared to other online surveys which on average only receive a response rate between 2 and 3% (insert ref). Also, against the background that no reminders were sent, and that the staff was contacted during the Norwegian summer holiday period, the response rate is high.

The majority of invitees were working at Norwegian Universities (83%), 9% were at Specialised University Colleges and 8% at Universities of Applied Sciences. In total 1,382 persons started the survey. Not all starters also filled the survey completely, about 55.6% of the respondents answered all questions relevant to them, less than 1% did not answer any question. On average respondents filled about 76.5% of the questions relevant to them. The analyses include all respondents who answered at least one question, therefore in the following analyses the base number of respondents will vary. Results will not indicate the number of respondents who did not provide an answer, unless this (e.g. 'don't want to indicate') was an available answer option. An analysis of the non-responses revealed that these were random, and therefore not bias the distribution of the valid answers.

Table 1: Sample, Responses and Response Rates to the CHEPS SFU Survey Summer 2019.

Higher Education Institutions	Emails sent	Failed	Duplicates	Bounced	Surveys started	Surveys completed	Response rate
Universities							
Nord University	656	1	0	5	67	62	10%
OsloMet	981	2	1	32	89	78	9%
NTNU	3361	0	0	26	184	167	5%
University of Agder	1074	0	0	18	65	61	6%
University of Bergen	3287	0	0	74	200	176	5%
University of Oslo	3503	1	1	22	293	265	8%
University of South-Eastern Norway	555	0	0	0	33	31	6%
University of Stavanger	1033	0	0	3	109	93	11%
UiT The Arctic University of Norway	1815	0	9	0	88	79	5%
Subtotal Universities	**16265**	**4**	**11**	**180**	**1128**	**1012**	**6%**
Specialised Colleges							
BI – Norwegian Business School	349	0	0	0	33	29	9%
Molde University College	143	0	0	0	6	6	4%
NHH Norwegian School of Economics	264	0	0	0	35	39	13%
Oslo National Academy of the Arts	201	1	0	0	12	12	6%
The Norwegian School of Sport Sciences	216	0	0	0	14	13	6%
The Oslo School of Architecture & Design	174	0	0	0	9	8	5%
VID Specialized University	348	0	0	1	28	26	8%
Subtotal Specialised Colleges	**1695**	**1**	**0**	**1**	**137**	**133**	**8%**
Universities of Applied Sciences							
Inland Norway University of Applied Sciences	994	0	0	0	79	75	8%
Queen Maud University College of Early Childhood Education	133	0	0	0	7	6	5%

Sámi University College	34				0	0	0%
Østfold University College	504	0	0	1	31	28	6%
Subtotal Universities of Applied Sciences	**1665**	**0**	**0**	**1**	**117**	**109**	**7%**
All HEIs	**19625**	**5**	**11**	**182**	**1382**	**1254**	**7%**

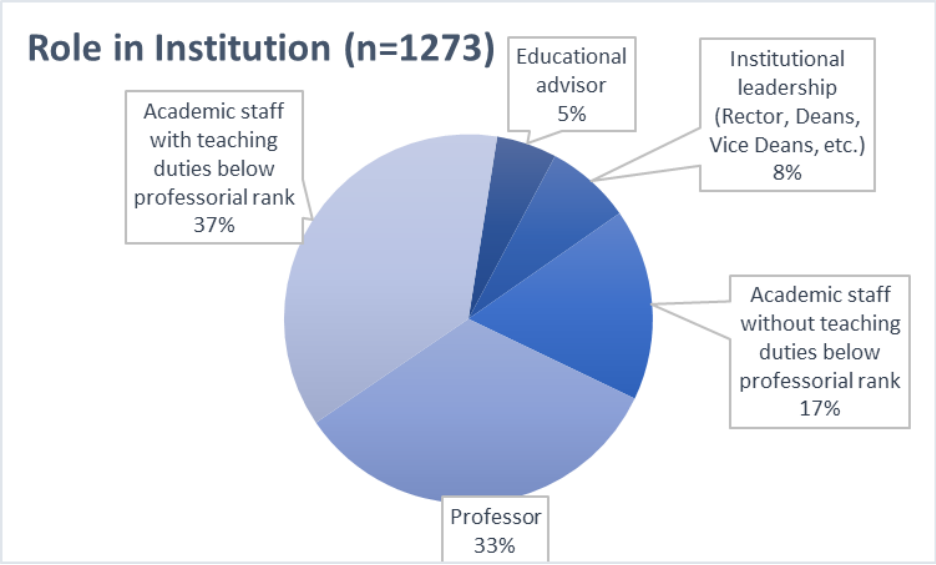
Source: CHEPS SFU Survey 2019, Author's calculations

6.2 The Sample-profile

In the survey respondents were asked to classify in which of the following five roles they were working: Institutional leadership (such as Rector, Deans, Vice-Deans, etc.), Professor, Academic staff with teaching duties below the professorial rank, Academic staff without teaching duties below the professorial rank, and Educational advisor.

From the 1,273 respondents providing a valid answer to this question, the academic staff with teaching duties (37%) and the professors (33%) are the two largest groups. Educational advisors (5%) and respondents with roles in institutional leadership (8%) have less frequently participated. More than three-quarters of the respondents work at the department level, 4% at the central level and 20% at the faculty level. From those working the at department or faculty level, a bigger group (30%) indicated to work in the area of social sciences and 22% from the humanities area. Natural and engineering sciences participated less frequently in the survey (17% and 12%), there are hardly respondents working in the area of agriculture. More than half of the respondents only recently started working in their current positions; in total, 56% were working in it for a period of up to five years. In total, 46% of the respondents are female, and 51% male, 3% either had a different sex or did not want to indicate.

Figure 4 Staff groups participating in the Survey, %



Source: CHEPS Survey SFU Evaluation

Table 2: Characteristics of professional groups, %, Question 2.1 "Gender", Q2.4 "Work level", Q57 "Disciplinary area of faculty/department", Q2.6 "Working in current position since…"

		Edu. advisor	Acad. staff with teaching duties below prof.	Acad. staff without teaching duties below prof.	Prof.	Inst. Leader-ship	Total
Work level	**Central level**	19%	2%	4%	1%	20%	4%
	Faculty level	44%	20%	17%	14%	33%	19%
	Department level	37%	79%	79%	85%	47%	76%
	Total (n=100%)	63	461	204	415	94	1237
Discipline of faculty/ depart.*	**Natural sciences**	16%	15%	25%	16%	9%	17%
	Engineering and technology	8%	11%	15%	13%	12%	12%
	Medical and Health sciences	24%	18%	17%	18%	17%	18%
	Agricultural sciences	2%	0%	1%	0%	1%	0%
	Social sciences	16%	32%	30%	31%	23%	30%
	Humanities	33%	23%	12%	22%	37%	22%
	No answer	2%	1%	1%	1%	0%	1%
	Total (n=100%)	51	452	196	409	75	1183
In current position for….	**1-2 years**	36%	32%	57%	12%	50%	31%
	3-5 years	18%	32%	30%	18%	17%	25%
	6-10 years	28%	17%	9%	22%	15%	18%
	11-15 years	8%	9%	2%	16%	11%	10%
	more than 15 years	10%	10%	2%	32%	7%	16%
	Total (n=100%)	61	420	182	392	88	1143
Gender	**Male**	34%	45%	48%	64%	45%	51%
	Female	63%	51%	50%	34%	54%	46%
	Don't want to indicate	3%	3%	1%	2%	1%	2%
	Other	0%	1%	0%	0%	0%	0%
	Total (n=100%)	67	470	212	423	95	1267

Source: CHEPS SFU Survey 2019, Author's calculations

** only respondents with work level faculty or department*

- The profile of the groups ***Academic Staff with Teaching Duties and Academic Staff without Teaching Duties*** are quite similar. Among the Academic Staff with Teaching Duties, more than half of the respondents work in the social sciences or humanities. Academic Staff without Teaching Duties work more frequently in the areas of natural sciences or engineering and technology. In both groups, most respondents work in their current position for less than five years. However, among the Academic Staff with Teaching Duties, we find more frequently respondents who work in their current positions for more than five years. For both groups, we find a more balanced representation of males and

females compared with the other staff groups, and the percentage of females is slightly higher than of male respondents.

- Most ***Professors*** work at the department level, and more than half of the respondents work in the area of the social sciences and humanities. Most professors work in their current position for already more than ten years. Nearly two out of three respondents from the 'Professors'-Group indicated to be male (64%), about 34% of this target group are females.
- Respondents with ***Leadership*** roles represent all work levels in higher education institutions; nearly half of them reported working at the department level. Those working at the faculty or department level more often reported that they work in the social sciences and humanities. Every second respondent of this group started to work in their current positions less than two years ago. More than half of respondents with leadership roles were females.

Unfortunately, we can only check the representativeness of the sample very roughly. Two reasons account for this: First, publicly available data on staff at Norwegian higher education institutions use a different categorization of staff than this report. Second, public data report on men-years, while the survey data do not provide information on the scope of employment.

Table 3 below lists the number of men-years at the surveyed Norwegian Higher Education Institutions in 2019. Across all institutions with available data the ratio of academic and administrative positions is 73%:27%. In the survey, this ratio is at 87%:13%. When evaluating the representativeness of the sample we also need to consider that in the survey sample did not include administrative staff with roles that did not link to education. Therefore, we would like to state that the survey sample in rough terms is representative for the population at Norwegian higher education institution. In the following no data weighing is applied.

Table 3: Staff at Norwegian higher education institutions.

	Total number of scientific employee (men-years)*	Total number of administrative employee (men-years)**	Subtotal	Total number of other employee (men-years)***	Total
Universities					
University of Bergen	2403	882	3285	659	3944
University of Oslo	3863	1625	5488	1119	6607
University of Stavanger	961	356	1317	165	1482
University of South-Eastern Norway	1129	385	1514	147	1661
UiT The Arctic University of Norway	2191	764	2955	556	3511
Oslo Met	1408	662	2070	131	2201
University of Agder	810	351	1161	143	1304
NTNU	4860	1408	6268	1133	7401
Nord University	866	319	1185	130	1315
Total university N	18491	6752	25243	4183	29426
Total university %	63%	23%	86%	14%	100%

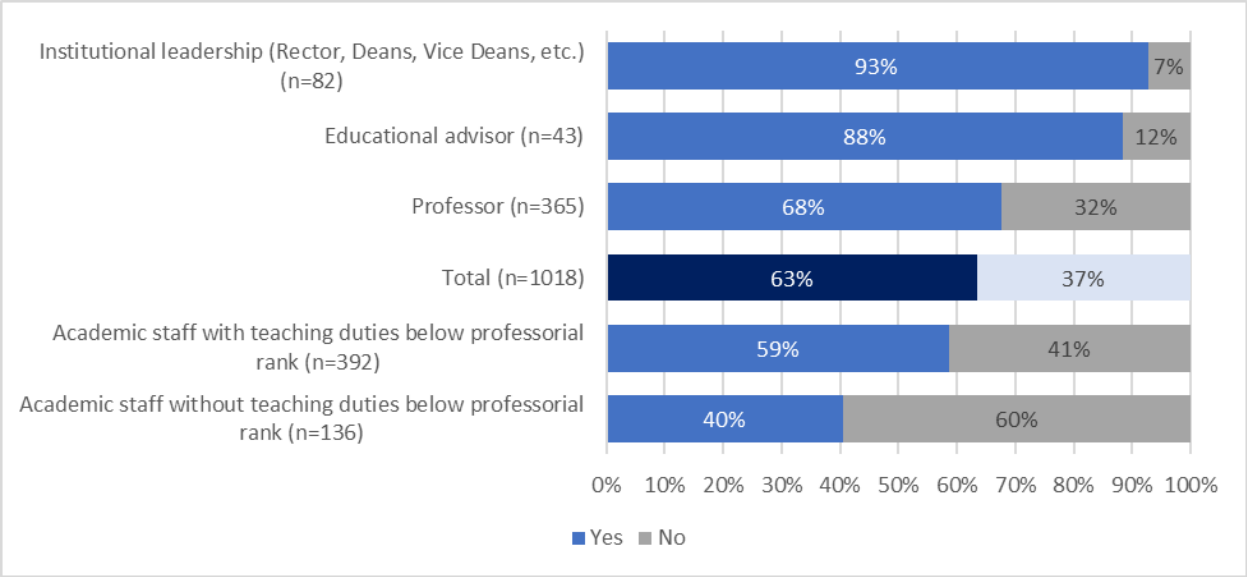
Ratio academic/ administrative staff	73%	27%	100%		
University colleges					
Molde University College	136	45	181	21	202
Oslo National Academy of the Arts	105	53	158	54	212
NHH Norwegian School of Economics	255	122	377	20	397
The Norwegian School of Sport Sciences	124	55	179	45	224
Total university colleges	721	305	1026	152	1178
Total University Colleges	61%	26%	87%	13%	100%
Ratio academic/ administrative staff	70%	30%	100%		
University of applied sciences					
Inland Norway University of Applied Sciences	641	249	890	110	1000
Østfold University College	365	128	493	77	570
Sámi University College	50	49	99	6	105
Total UAS	1056	426	1482	193	1675
Total UAS	63%	25%	88%	12%	100%
Ratio academic/ administrative staff	71%	29%	100%		
Total Ratio academic/ administrative staff all HEI	73%	27%	100%		

Source: Nøkkeltall for universiteter og statlige høyskoler 2019, Diku
** Total number of scientific. employees (man-years) = Includes job area Teaching, research and dissemination positions (according to new categorization of positions);*
***Total number of employees (man-years) = Includes the job group Administrative positions (according to new categorization of positions);*
**** Total number of other positions (man-years) = Includes the technical groups and other technical and administrative positions (according to new categorization of positions)*

Knowing the SFU-initiative

The groups of staff we involved in the survey differ significantly in terms of the percentage of respondents who know about the SFU initiative. In total, two out of three reported knowing the SFU-initiative, while among the respondents from the institutional leadership nearly all respondents know the SFU-initiative. Among the academic staff below the professorial rank the percentage of respondents knowing about the Initiative is lower than in total. (Figure 5)

Figure 5 Knowing the SFU initiative, in per cent, Question 9.1.: "Do you know the SFU-initiative (i.e. the Norwegian Centers for Excellence in Education)?"



Source: CHEPS SFU-Survey 2019, Author's calculations, no significant differences between staff groups.

6.3 Types of SFU Users – Adopter, Adapters and Observers

Identifying different user-types

The first step in this analysis is to distinguish the different types of users. To this end, we built an additive index based on the information how frequently users apply information, knowledge and practices that were connected to an SFU or the SFU initiative.[9] The index ranges between 0 points at the minimum and 16 points at its maximum. Based on the sum respondents achieved we classified three user groups:

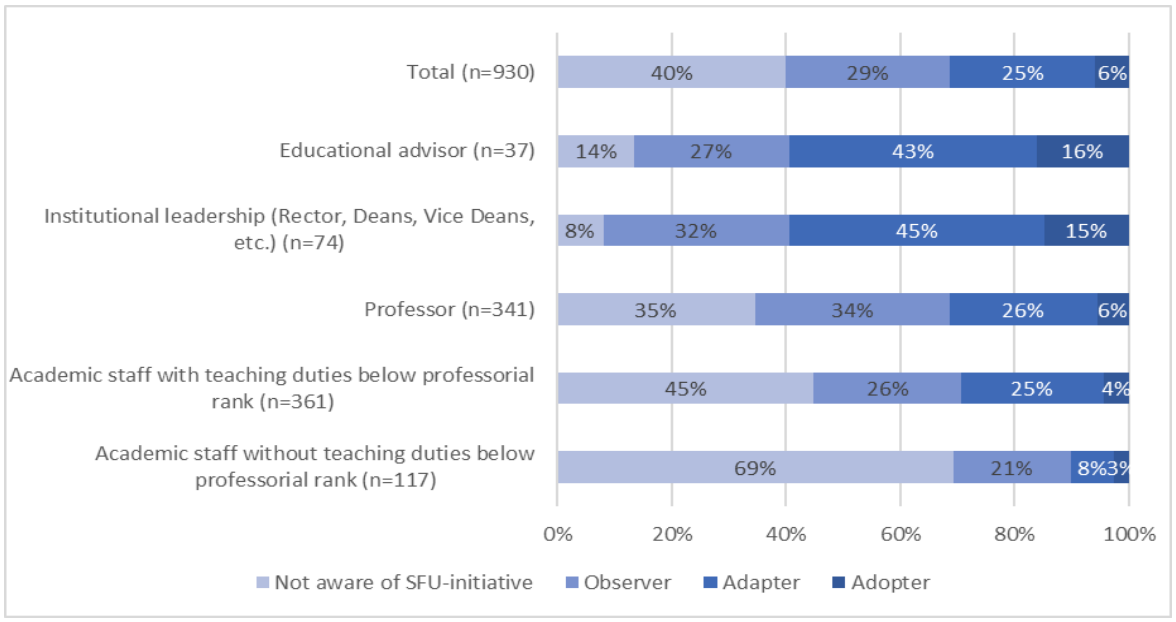
[9] These were question Questions Q13.3B (Item 1, 2, 4, 5) and Q13.2AC (Item 1, 2, 4, 5). For the index we recoded the original values: 1 – never to 0, 2 – rarely to 1, 3 – occasionally to 2, 4 – frequently to 3 and 5 – very frequently to 4, 6 – don't know was treated as missing value. The index represents the sum of the recoded values of the four items. The calculation did not adjust for missing values (e.g. through calculating the average evaluation of the items, including only the valid answers) but treated them as not using the achievement mentioned in the outcomes.

- '***Observers'*** represent respondents with 0 points, and thus those knowing but not applying the SFU achievements;
- '***Adapters'*** represent respondents who score between 1 and 10 points, and therefore use the SFU achievements less frequently;
- '***Adopters'*** finally represent respondents with 11 to 16 points, and who use the SFU achievements frequently or very frequently.
- Further, we identified as a fourth group those respondents who were '***Not aware of the SFU-initiative'***.[10] These were respondents who did not know about the SFU initiative.

The distinction of Adapters and Adopters foremost represents how frequently the SFU-users have actively engaged with the SFUs and their innovations. However, both User-types might have adapted or even adopted the SFU enhancements. Unfortunately, the additive index does not perfectly reflect how SFU-users employ SFU enhancements. Thus, the following analyses will illustrate their specific handling of SFU enhancements.

In total, based on the information provided, we were able to categorise 930 respondents. The smallest group are the Adopters with 6%; Adapters make up 25% so that in total three in ten academics can be called active users of the SFU scheme. The largest group in the sample are the respondents who are not aware of the SFU initiative (40%). Taking those not aware together with Observers (29%), more than two-thirds (69%) of respondents did not make use of the SFU opportunities (see Figure 6).

Figure 6 Distribution of SFU user-types in staff groups, %



Source: CHEPS SFU Survey 2019, Author's calculations, sig. 0.000

[10] This was done with the data collected with Question Q9.1, that asks if respondents would know the SFU initiative. We classified respondents who selected the answer 'No' as 'Not aware of SFU-initiative'.

The SFU user-types distribute significantly different within the different staff categories. Among respondents from the institutional leadership and the educational advisors, the percentage of Adapters and Adopters is highest compared to the other staff groups. On the other hand, the portion of respondents who were not aware of the SFU-initiative is highest among the academic staff who are not involved in teaching.

Individual characteristics of SFU-User Types

In the following, we will study the individual characteristics of the three User-Types and the Non-Users and to what extent they already engaged in educational enhancement in more detail. The four types differ significantly concerning their role in the institution, the highest earned degree, disciplinary area and period they are already working in their current job (see Table 4).

Though there is quite some variety among them, a typical ***'Observer'*** tends to be a male professor from the social sciences. Both, respondents who just recently started in their current job as well as respondents who were already working in it for more than 5 years are among them.

The type ***'Adapters'*** includes foremost professors and academic staff below the professorial rank with teaching duties. Males and females are equally represented. Adapters work in all disciplinary areas. Interestingly, adapter either only recently started in their current job (less than 2 years ago) or already work in their current job for more than 10 years.

'Adopters' have the most distinct profile of those respondents using the SFU-achievements. Compared to the other types they are mostly male, have a role in the institutional leadership and more frequently work in the disciplinary areas of the natural sciences and engineering and technology. Every third adopter has recently established in his or her current job due to working in it for 3 to 5 years.

Respondents who were assigned to the type ***'Not aware of SFU-initiative'*** include a high percentage of academic staff below professorial rank. Both, staff with and without teaching duties can be found among them more frequently. Respondents from the institutional leadership are hardly found among them. A high percentage is from the social sciences, and the majority of respondents is fresh to their jobs, working in their current position for less than five years. Among them, the percentage of doctoral degree-holders is lowest, which indicates that some respondents are fresh to academia and at the start of their career.

Table 4: Individual characteristics of SFU-user groups, in %, Questions

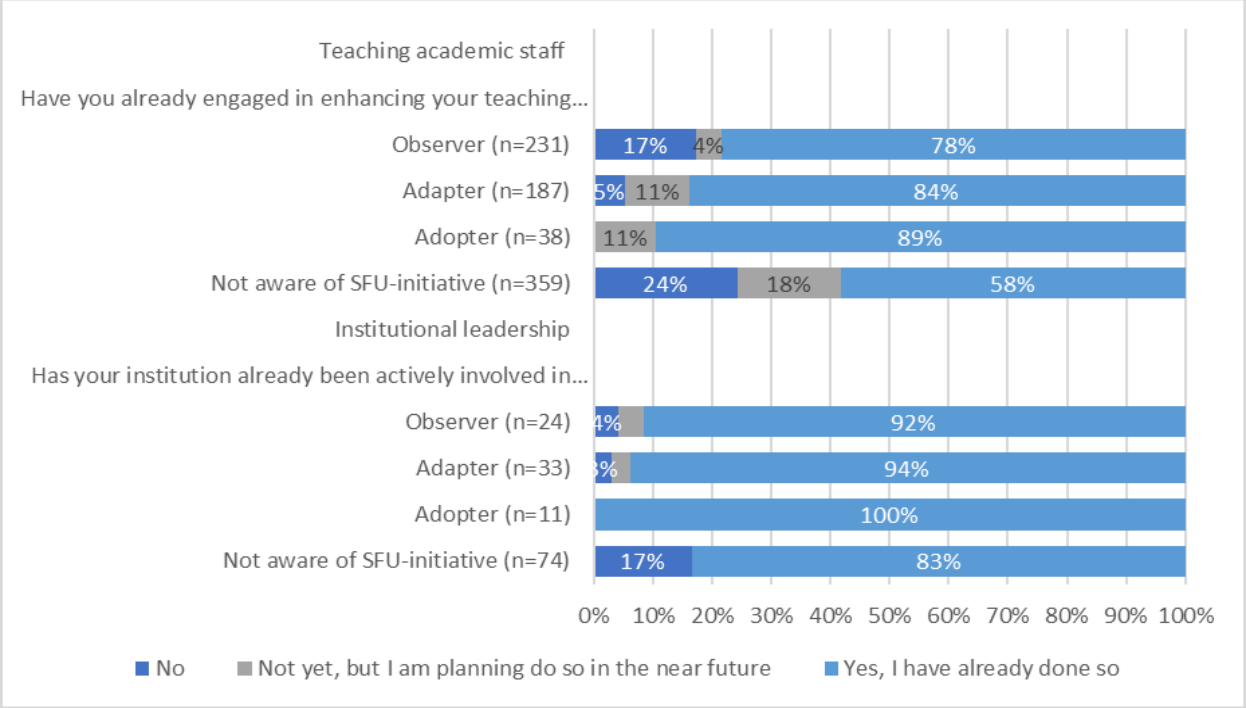
	Observer	Adapter	Adopter	Not aware of SFU-initiative	Total
Main role in the institution*					
Educational advisor	4%	7%	11%	1%	4%
Academic staff with teaching duties	35%	38%	29%	44%	39%
Academic staff without teaching duties	9%	4%	5%	22%	13%
Professor	43%	37%	35%	32%	37%
Institutional leadership	9%	14%	20%	2%	8%
Total (n=100%)	267	236	55	372	930
Gender					
Male	54%	50%	62%	51%	52%
Female	43%	49%	38%	46%	46%
Don't want to indicate	2%	1%	0%	2%	2%
Other	1%	0%	0%	1%	0%
Total (n=100%)	267	236	55	371	929
Highest earned degree*					
Bachelor's degree or similar	0%	3%	2%	1%	1%
Master's degree or similar	22%	29%	29%	32%	28%
Doctoral degree	78%	69%	69%	66%	70%
No higher education degree	0%	0%	0%	1%	0%
Don't want to indicate	0%	0%	0%	1%	0%
Total (n=100%)	267	236	55	372	930
Disciplinary area of current job*					
Natural sciences	14%	17%	29%	13%	15%
Engineering and technology	9%	14%	19%	13%	12%
Medical and Health sciences	18%	22%	8%	18%	18%
Agricultural sciences	0%	1%	0%	1%	0%
Social sciences	31%	23%	23%	38%	31%
Humanities	28%	23%	21%	18%	22%
Total (n=100%)	254	221	52	364	891
Working in current job for…*					
1-2 years	25%	24%	15%	36%	28%
3-5 years	25%	21%	33%	28%	26%
6-10 years	21%	19%	21%	15%	19%
11-15 years	11%	15%	15%	8%	11%
more than 15 years	19%	21%	15%	13%	17%
Total (n=100%)	253	231	52	342	878

*Source: CHEPS SFU Survey 2019, Author's calculations, * sig. ≤0.05*

(Plans for) active engagement in educational enhancement

User-Types also differ regarding their experiences of enhancing educational practice. The survey asked teachers to report if they have already changed their teaching practice with the help of educational innovations or plan to do so in the future. Institutional leaders were asked if their institution supports educational enhancement through the implementation of educational innovations. The survey asked both groups to report on educational innovations in general and did not refer to SFU educational innovations. Figure 7 below sets out that most teachers have already engaged in educational enhancement or plans to do so in the near future. Unsurprisingly, this percentage is highest among the Adopters. Respondents who are not aware of the SFU initiative less often report that they engaged in educational enhancement. However, among this groups we also the highest percentage of respondents who plan to enhance their education.

Figure 7 Has teacher/institution already engaged in educational enhancement? Questions Q4B - Have you already engaged in enhancing your teaching activities? and Q4AC – Has your institution already been actively involved in enhancing the quality of its education



*Source: CHEPS SFU Survey 2019, Author's calculations, * sig. ≤0.05*

Stimulation of educational enhancement

Teachers were asked what reasons have stimulated them to enhance their teaching activities. For teachers, the most important stimulus was their personal interest in enhancing teaching skills. Also, their wish to try something new motivated teachers strongly. Demands of students for more innovative forms of teaching were the least mentioned stimulus. Institutional incentives, i.e. the provision of time and money for education enhancement was not mentioned as a strong driver. The groups differ clearly in how they evaluate the stimuli. On average, Adapters and Adopters rate the stimuli as having more impact than the Observers and the respondents who are not aware of the SFU-initiative. Adopters evaluate the reasons the highest, and their mean evaluations differ significantly from the Observers and the

respondents not aware of the SFU-inititative. They evaluate in particular the possibility to advance their careers when engaging in teaching, the provision of financial support in the institution and the demand of students higher than these groups.

Table 5: Reasons that stimulated teaching staff to enhance their teaching activities. Means and Valid N; Question Q7B To what extent have the following reasons stimulated your educational enhancement activities?, Values: 1 'Not at all', 2 'To some extent', 3 'To a moderate extent', 4 'To a high extent', 5 'To a very high extent'

	Observer	Adapter	Adopter	Not aware of SFU-initiative	Total
Personal interest in enhancing teaching skills	4.0 218	4.3* 186	4.5** 38	4.1 312	4.1 754
Trying out a new educational approach	3.5 208	3.6 182	4.1** 38	3.4 290	3.5 718
Disappointment about students' learning outcomes	2.4 195	2.6 174	2.7 34	2.4 266	2.5 669
Improvement of teaching skills helped to advance in career.	2.1 188	2.5* 168	3.2** 36	2.4* 277	2.4 669
My institution provided me with time for engaging in educational enhancement	1.8 198	2.4* 177	2.9** 35	2.2* 267	2.2 677
Recommended by colleague.	1.9 174	2.4** 155	2.6* 33	2.1 248	2.1 610
My institution provided financial support for engaging in educational enhancement	1.6 183	2.2* 163	2.7** 36	2.0* 248	2.0 630
Students asked for more innovative forms of teaching	1.7 191	2.1* 173	2.6** 35	1.9 260	1.9 659

Source: CHEPS SFU Survey 2019, Author's calculations, Mean different from group 'Observer' at sig. 0.05; ** Mean different from the groups 'Observer' and 'Not aware of SFU-initiative' at 0.05.*

Conclusions

There are clear differences among the SFU-Users regards their individual characteristics. Interestingly, Adopters can be frequently found among the institutional leadership. Among teaching staff, a higher percentage is aware of the SFU-initiative and observes it but engages less in educational enhancement. Respondents, who are not aware of the SFU-initiative are interested in enhancing their teaching practice, as a higher percentage indicates that they plan to change their practice. For them, it might be interesting to learn more about the SFU-initiative and its achievements.

Besides their professional role, also the respondents' career levels are determinants to what extent they work in educational enhancement. We find that staff who just recently started to work in their current job, and thus might be at the start of their careers are more likely to engage in educational enhancement. Results on the stimuli for enhancement show that for some respondents the career advancement related to improving teaching skills is an important driver. Further, among the teaching staff who were classified as Adapters or Adopters we find that self-improvement and the chance trying-out something new are very important drivers. The availability of institutional support through the provision of time and money did not show as important stimuli in the analysis. However, when interpreting these results one must also

consider that respondents might not have rated this as a strong impact due to the non-availability of this kind of institutional support.

6.4 Institutional setting/context

Besides the individual characteristics also the institutional setting in which the respondents work can have an impact on their engagement in educational enhancement and how well they are able to pick up educational innovations. This section will analyse if there are differences in the institutional setting of the SFU-users.

Due to privacy regulations we cannot assign respondents to specific higher education institutions. For the same reason, we did not include questions asking for the type of institution, it size or geographical area.[11] Thus, in the following we cannot address these characteristics. However, when addressing institutional characteristics, we seek to understand how respondents differ in their perceptions and evaluations of the institutional support of their engagement in educational enhancement.

To this end we will analyse the following variables:

- the general importance of educational enhancement;
- the change of the value given to education in the institution;
- the respondents' evaluations of selected institutional characteristics for adopting educational enhancements.

The general importance of educational enhancement

Across all SFU-User-Types and among the group of respondents not aware of the initiative a high percentage reports that educational enhancement is very important (see Figure 8). This is true for both levels, the institutional as well as the departmental level. From the SFU-users, the Adapters and the Adopters evaluate the importance at both levels significantly higher than the Observers (see Table 6).

Table 6: Evaluation of general importance of educational enhancement. Means, Question Q3.1 "Please rate the general importance of educational enhancement for the different levels listed in the table below", Values 1 'Not at all important', 2 'Slightly important', 3 'Moderately important', 4 'Important', 5 'Very important'.

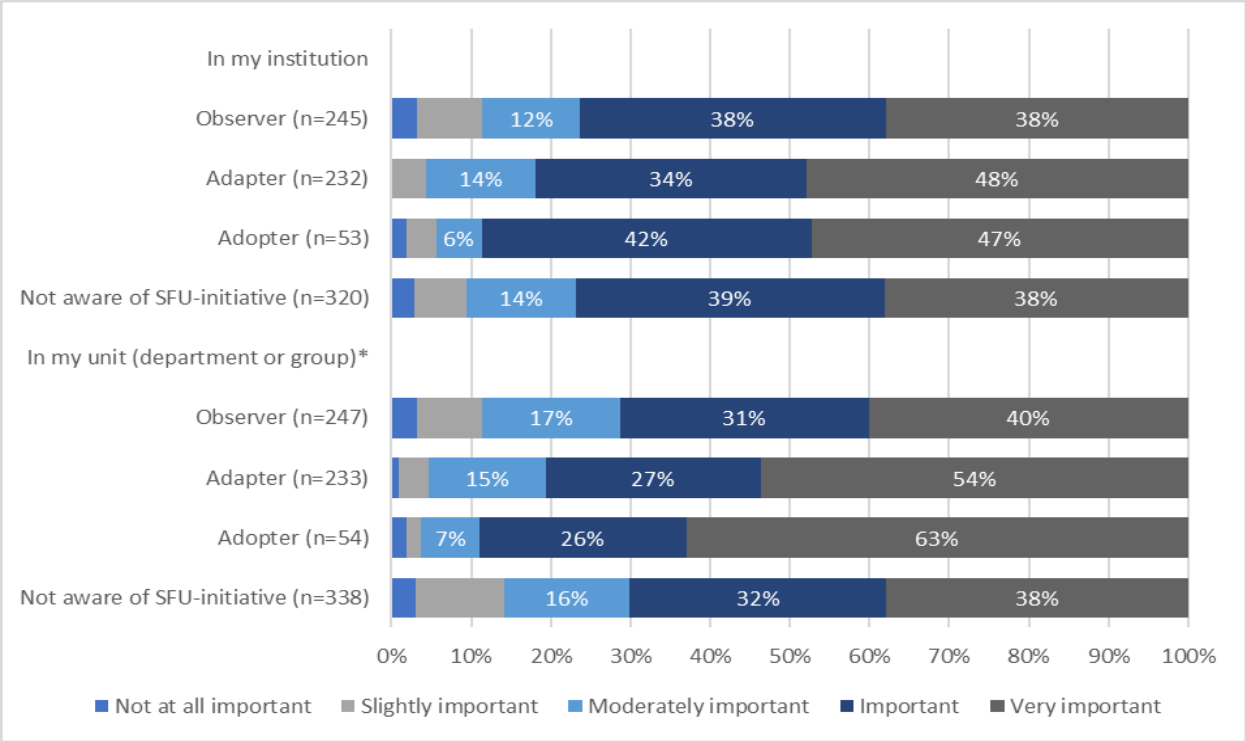
	Observer	Adapter	Adopter	Not aware of SFU-initiative	Total
... in my institution	4.0 (n=245)	4.3* (n=232)	4.3 (n=53)	4.0 (n=320)	4.0 (n=850)
... in my department	4.0 (n=247)	4.3* (n=233)	4.5* (n=54)	3.9 (n=338)	4.1 (n=872)

*Source: CHEPS SFU-Survey 2019, Author's calculations, * Mean is significantly different from the groups 'Observer' and 'Not aware of the SFU-initiative' at the 0.05-level.*

[11] Due to the low number of respondents per institution we would have been able to easily reconstruct specific identities with the help of further information such as role, disciplinary area, and gender.

The data reveal differences between the four groups regarding their evaluations of the general importance of educational enhancement in their institution and their department. Among Adopters, the percentage of respondents who find this important to very important is highest; The percentage is lowest among the Observes and respondents who are not aware of the SFU-initiative. Surprisingly, there are no strong differences in the evaluations of the institutional and departmental level. Other research frequently stated that individuals rate their close context differently than their wider environment. The frequencies show that more respondents find educational enhancement very important at their institutional level. This might point to that Norwegian higher education institutions engage in educational enhancement and that this is recognized by their staff.

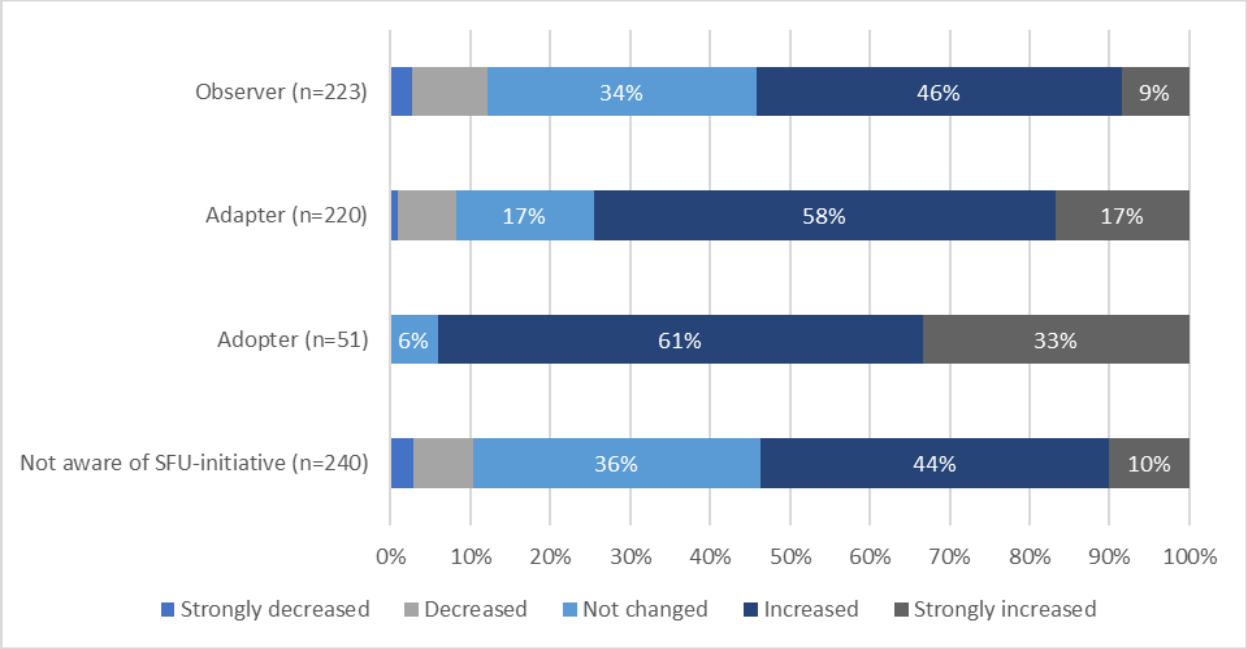
Figure 8 Evaluation of general importance of educational enhancement. %, Question Q3. 1 "Please rate the general importance of eduational enhancement for the different levels listed in the table below", Values 1 'Not at all important', 2 'Slightly important', 3



*Source: CHEPS SFU-Survey 2019, Author's calculations, * sig.: 0.001*

This is also reflected in the evaluation of the change of the value given to education in the respondents' institution the last five years. (Figure 9) Overall, we find, that more than half of the respondents believes that the value given to education has increased. While among the Adopters and Adapters the majority believes this, Observers and respondents who are not aware of the SFU-initiative are more modest in their evaluations. A smaller percentage of them even believes that the value given to education has decreased. Most Adopters are positive about this change, more than 90% of them report that they find that the value has increased. This high percentage is also related to the higher number of respondents who have role in the institutional leadership and engaged in increasing the value of education due to their role.

Figure 9 Evaluation of the change of the value given to education in the last five years, %, Question Q8: To what extent has the value given to education changed in your institution in the last five years? Values: 1 'Strongly decreased'; 2 'Decreased', 3 'Not changed', 4 'Increased', 5 'Strongly increased'.



Source: CHEPS SFU-Survey 2019, Author's calculations, sig.: 0.000

Evaluation of institutional aspects supporting the implementation of educational enhancement

The survey also asked respondents to evaluate several institutional aspects that have an impact on the adoption of educational innovations. These aspects included the support of the institutional leadership, the availability of resources, the readiness of staff and students to accept educational innovations, as well as their perceptions of the institutional infrastructure and of the quality culture of their institutions (Figure 10).

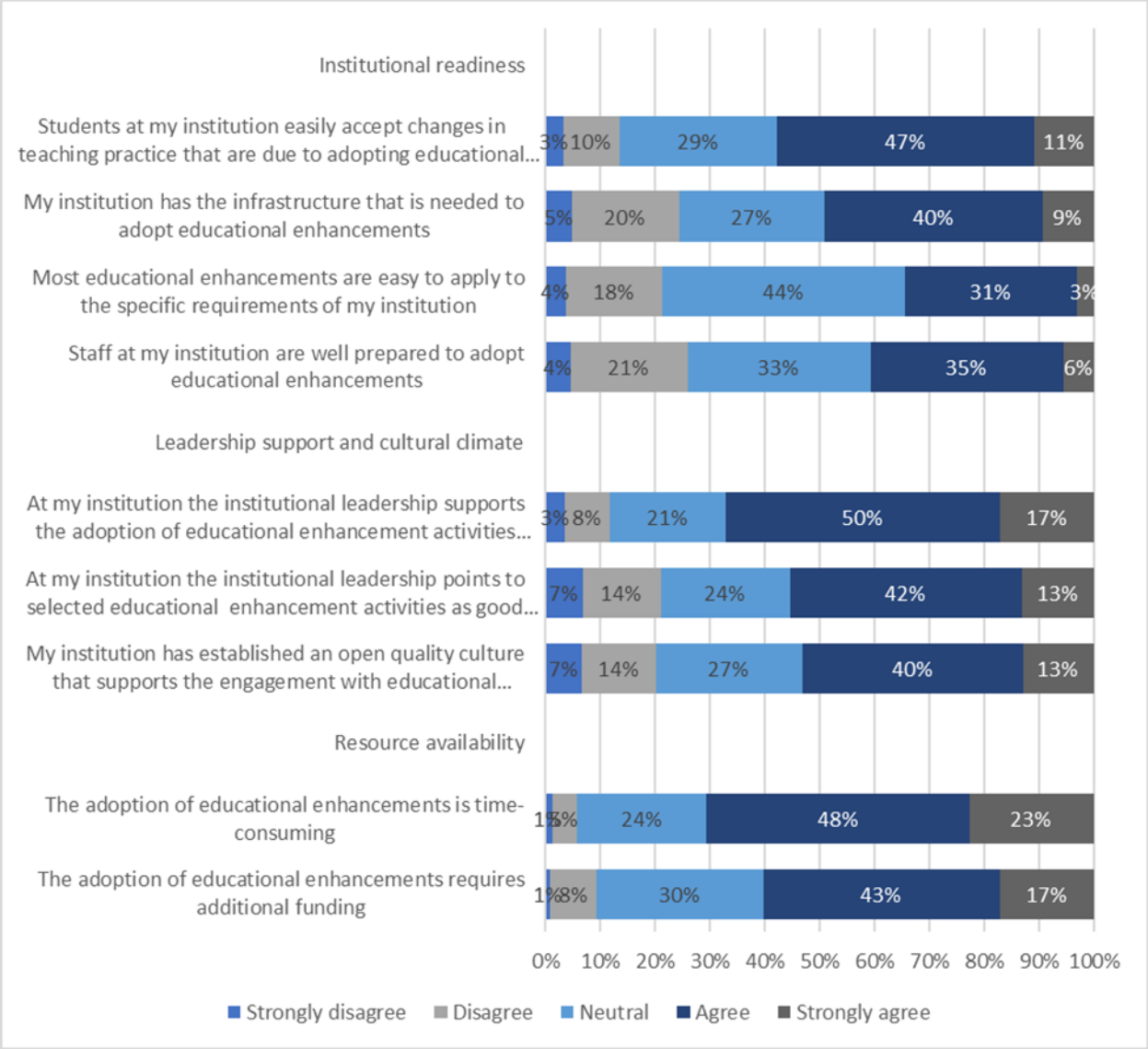
The respondents evaluated the aspects with a bipolar 5-point Likert scale that ran between -2 'strongly disagree' and 2 'strongly agree'. As this evaluation includes nine items, we first applied a factor-analysis to find out which factors or dimensions underlie the respondents' answers. The analysis revealed three factors, which are:

- The *Institutional readiness*, which includes the preparedness for staff and students for educational enhancement and how well educational innovations can be applied to institutional requirements and the already existing infrastructure.
- The second dimension that we identified was the *Leadership support and cultural climate*.
- Finally, *Resource availability* establishes the third dimension.

Comparing these three dimensions, we find that the respondents more frequently agree that more 'weak' aspects such as leadership support and quality culture are aspects that facilitate the adoption of educational enhancement activities. A slightly lower percentage of them is convinced that their institution is sufficiently prepared to handle educational enhancement. Around four out of ten respondents find that

the academic staff is well prepared to adopt educational enhancements. Further, respondents are indecisive regarding the adaptability of educational enhancements. Nearly half of them voice a neutral position concerning the adaptability of educational enhancements. The third dimension, the availability of resources, reveals a clear picture: most respondents agree that the adoption of educational enhancements is time-consuming as well as it requires additional funding.

Figure 10 Evaluation of institutional aspects and their role for the adoption of any educational innovation, %, Question Q54: How do you rate the aspects below for the adoption of any educational enhancement in your institution or in your work?, Values: -2 'strongly disagree', -1 'disagree', 0 'neutral', 1 'agree', 2 'strongly agree'



Source: CHEPS SFU-Survey 2019, Author's calculations

In order to compare the evaluations of the User-Types, we calculated how they, on average, evaluated the three dimensions we identified in the factor analysis (see Table 7).

Adopters evaluate institutional readiness, leadership and cultural climate more positively than all other types of users. Further, Adopters appear to be less affected by the (non-) availability of resources as they

less frequently agree to these items. Observers, on the other hand, on average, are more neutral in their evaluations of the different aspects than the other user groups, they even rate the institutional readiness as well as leadership support and cultural climate lower than respondents who are not aware of the SFU-initiative.

Test statistics revealed that the evaluations of Observers are significantly different from Adopters and Adapters regarding the institutional readiness and leadership support/cultural climate.

Table 7: Average evaluation of aspects determining the adaptation of educational enhancement activities. Means. Dimension concluded from Question 54: How do you rate the aspects below for the adoption of any educational enhancements in your institution or in your work?, Range of values:-2 'strongly disagree' to 2 'strongly agree'.

Dimension	Observer (n=267)	Adapter (n=236)	Adopter (n=55)	Not aware of SFU-initiative (n=372)
Institutional readiness	0.15	0.37*	0.55*	0.28
Leadership support and cultural climate	0.30	0.69*	0.80*	0.49
Availability of resources	0.91	0.84	0.78	0.91

*Source: CHEPS SFU survey 2019, Author's calculations, * sig. ≤ 0.05*

Conclusions

Looking at the institutional setting and how it relates to educational enhancement, we find that many respondents find that educational enhancement is important in their institution and that the value it gives to education has increased strongly in the past five years. Adopters have a very strong opinion about both aspects. Also, more than half of the respondents who were classified as Observers and as being not aware of the SFU initiative indicate that there was an increase in the importance of education enhancement and in the value given to education. We therefore assume, that in the recent years attitudes towards education and its enhancement have changed to a broader acceptance at Norwegian higher education institutions.

The results on the institutional aspects determining the adaptation of educational enhancements that Adapters and Adopters perceive these aspects differently than Observers and the respondents who are not aware of the SFU-initiative. Both latter groups agree that the availability of resources is important, while institutional readiness, Leadership support and cultural climate play a less important role. Adapters and Adopters think differently. They agree that these aspects are also important, for them the leadership support and the cultural climate are important aspects, which to some extent is related to their roles in the institutional leadership.

6.5 How do SFU-users perceive the SFU-initiative and the SFU?

This section will investigate in more detail how the respondents perceive the SFU initiative and SFU achievements. To this end, we will in first study how, in general, the respondents evaluate the relevance of the SFU-initiative for their work. We will also apply a comparative perspective, i.e. we will investigate how relevant the SFU-initiative is when comparing it to other national and institutional initiatives of which the respondents are aware. Secondly, we will zoom in to the respondents' perceptions of the eight current SFU. This part will ask to what extent SFU-users know about the SFUs, how relevant they find the SFUs, if

they know specific SFU achievements, and if so, what achievements they know. Also, this section will apply a comparative perspective and ask how relevant the specific SFU achievements are when comparing them to other educational enhancements that are not related to the SFU-initiative. Both sections will address how the respondents learned about the SFU-initiative and the other enhancements.

Learning about the SFU-initiative

In the following, our analysis will zoom into how the SFU-user types learned about the SFU-initiative.

The results show that SFU-Users learn about the SFU initiative in various ways. However, in total, every fifth User does not remember through which channel they learned about the scheme (Table 8). The majority of Users has learned about the SFU-initiative from a colleague; the call for funding is another important source, in particular for the Adopters. Other NOKUT-communications such as their Website, their Conference and the SFU Magazine have been used less frequently, but we also find that the User-Types use these communications significantly different. A high number of the Adopters report having learned about it from the NOKUT-Website and the Calls for funding. Adapters also use the NOKUT-Website but less frequently than the Adopters. Adopters appears to be most actively searching for information about the SFU-initiative. This might also be related to their roles in the institutional leadership. They appear to seek information about the initiative in a more targeted manner and more frequently than the other two groups.

Table 8: Learned about the SFU-initiative through…, Percentage, Multiple answers, Question: Q9.2 "How did you learn about the SFU-initiative? (dissemination channels)

	Observer (n=224)	Adapter (n=214)	Adopter (n=48)	Total (n=486)
From a colleague	40%	51%	44%	45%
Calls for funding for the SFU-initiative	28%	40%*	58%*	36%
I don't remember	33%**	13%	4%	21%
NOKUT Website	8%	19%*	44%**	16%
In an internet search	12%	10%*	2%	10%
NOKUT conference	2%	12%*	19%*	8%
Different conference	2%	10%*	10%*	6%
SFU Magazine	1%	7%*	13%*	5%
From a journal article	4%	5%	6%	5%

*Source: CHEPS SFU-Survey 2019, Author's calculations, * percentage different from group 'Observer' at the 0.05 level, ** percentage different from all other groups at the 0.05 level*

The survey also collected information about the use of the information provided through NOKUT's dissemination activities. The results suggest that these activities do not reach out well to the academic staff at the Norwegian higher education institutions. On average, Observers report having hardly used this information, Adopters use the resources on average "sometimes". The NOKUT conference, the NOKUT website and the Reports issued by NOKUT are the most used information resources, while the SFU magazine and the Podcasts have not been frequently used (see Table 9).

Table 9: Average Use of information resources provided by NOKUT, Means, Question Q17 "How often do you use the following resources provided by NOKUT…?", Values 1 'Never', 2 'Sometimes', 3 'Frequently', 4 'Often', 5 'Always'.

		Observer	Adapter	Adopter	Total
Nokut website	*Mean*	1.5	1.8*	2.3**	1.7
	n	223	197	47	467
SFU Magazine	*Mean*	1.0	1.3*	2.0**	1.3
	n	198	179	46	423
Podcasts	*Mean*	1.1	1.2	1.6**	1.2
	n	208	180	47	433
Reports	*Mean*	1.6	1.9*	2.3**	1.8
	n	220	195	47	462
Conference	*Mean*	1.4	1.8*	2.5**	1.7
	n	220	195	47	462

*Source: CHEPS SFU-Survey 2019, Author's calculations, * Mean is significantly different from the group 'Observer' at the 0.05-level. ** Mean is significantly different from the groups 'Observer' and 'Adapter' at the 0.05-level.*

Those respondents who have already used the NOKUT information resources evaluate them on average as 'somewhat useful'. The evaluations are again highest among Adopters, while Observers are more likely to evaluate them as 'not useful'. The Nokut Website, the Conference, and the reports appear to provide the most useful information for all User-Types (see Table 10).

Table 10: Average evaluation of usefulness of information resources provided by NOKUT, Means, Question Q17 "… How useful is the provided information?", Values 1 'Not useful at all', 2 'Not useful', 3 'Somewhat useful', 4 'Useful', 5 'Very useful'.

		Observer	Adapter	Adopter	Total
Nokut website	*Mean*	3.0	3.5*	3.8*	3.3
	n	95	114	31	240
SFU Magazine	*Mean*	1.5	3.0*	3.7**	2.8
	n	29	52	25	106
Podcasts	*Mean*	2.0	2.9*	3.6*	2.7
	n	36	34	19	89
Reports	*Mean*	3.1	3.6*	3.9*	3.5
	n	89	104	31	224
Conference	*Mean*	2.7	3.6*	4.2**	3.4
	n	73	98	32	203

*Source: CHEPS SFU-Survey 2019, Author's calculations, * Mean is significantly different from the group 'Observer' at the 0.05-level. ** Mean is significantly different from the groups 'Observer' and 'Adapter' at the 0.05-level.*

Engaging with the SFUs

A first question when analysing the engagement with the SFUs is how many of the SFUs the respondents know. Results show that 14% of all SFU-Users did not hear about any specific SFU, 11% report to have already heard about all eight SFU. On average all SFU-users heard of 2.8 SFUs. Observers have heard about

a lower number of SFUs compared to Adapters and Adopters. Among Observers every fourth did not hear about any SFU, while this were only 5% among the Adapters. Adopters at least have heard about two SFU. This is also reflected in the average number of SFU they heard of, on average Adopters report 6.2 SFU they heard of, while this number is only at 1.7 for the Observers.

Table 11: Number of SFUs heard of, % and Mean, Question Q9.3 How frequently have you heard of the following SFU

Number of SFU heard of	Observer (n=266)	Adapter (n=236)	Adopter (n=55)	Total (n=557)
0	25%	5%	0%	14%
1	35%	20%	0%	25%
2	18%	20%	13%	18%
3	10%	16%	4%	12%
4	4%	14%	15%	9%
5	1%	6%	4%	3%
6	1%	5%	5%	3%
7	2%	3%	7%	3%
8	4%	10%	53%	11%
Average number of SFUs heard of	1.7	3.3	6.2	2.8

Source: CHEPS SFU-Survey 2019, Author's calculations, sig. 0.05

A second question relates to how frequently SFU-Users already heard from the eight SFUs? Across all User-Types, we find that the average frequency is low, i.e. on average, the respondents heard 'rarely' about the SFUs. Respondents most often reported to have heard of the older SFUs 'Matric', 'ProTed' and 'bioCeed' more frequently, but also about the recently established SFUs 'CCSE', 'Engage' and 'Excited'. For the SFUs 'CEMPE' and 'CEFIMA' we find the lowest values; it seems that respondents hardly heard of these two SFUs (see Table 12).

Comparing the three User-Types we find that they differ significantly regarding the frequency they heard of the SFUs. Adopters on average have 'occasionally' heard of all SFUs while Observers appear to have never heard of most of the SFUs. Adapters report having heard about the SFUs rarely. In all three groups, we find that respondents most frequently heard about 'bioCeed', 'ProTed' and 'Matric'. Adopters also more often heard about 'CCSE' and 'Excited'. Respondents from all three groups report that they heard of CEMPE and CEFIMA less often.

Table 12: How frequently SFU Users heard about the SFUs, Question Q9.3: How frequently have you heard about the following SFU?, Means, Values: 1 'Never', 2 'Rarely', 3 'Occasionally', 4'Frequently', 5 'Very frequently'

SFU	Observer (n=267)*	Adapter (n=236)*	Adopter (n=55)*	Total (n=558)
bioCEED – Centre for Excellence in Biology Education	1.5	2.1*	3.1**	1.9
CCSE – Center for Computing in Science Education	1.3	1.9*	2.8**	1.7
CEFIMA – Centre of Excellence in Film and Interactive Media Arts	1.2	1.3*	2.1**	1.3
CEMPE – Centre of Excellence in Music Performance Education	1.1	1.6*	2.5**	1.4
Engage – Centre for Engaged Education through Entrepreneurship	1.3	1.7*	2.5**	1.6
ExcITEd – Centre for Excellent IT Education	1.4	1.8*	2.7**	1.7
MatRIC – Centre for Research, Innovation and Coordination of Mathematics Teaching	1.4	1.9*	3.0**	1.8
ProTed – Centre for Professional Learning in Teacher Education	1.7	2.1*	3.0**	2.0

*Source: CHEPS SFU-Survey 2019, Author's calculations, * Mean is significantly different from the group 'Observer' at the 0.05-level. ** Mean is significantly different from the groups 'Observer' and 'Adapter' at the 0.05-level.*

Besides investigating how frequent the respondents heard of the SFU, we also analysed the frequencies of values underlying the means (see Figure 22 in the Annex 5). An important result is that there is no striking difference between the younger SFUs, i.e. those implemented in 2018 and the older SFUs that were implemented in 2012. It appears that SFU-users seek more often information of SFUs that work in cross-disciplinary areas and provide achievements that might be useful to a wider community. This is true for the SFUs MatRIC, ExcITEd, ProTed, CCSE that cover cross-cutting teaching themes (e.g. the majority of academic programmes includes teaching in mathematics (as provided by MatRIC), also the ProTed is relevant to a higher number of academic programmes). CEFIMA and CEMPE appear to be more oriented to music and arts which might make it difficult for outsiders to easily link their achievements to their disciplines.

The analysis of the relevance the SFUs have for the SFU-Users reveals that to some extent, the frequency SFU-Users heard about the SFUs does not directly link to how relevant the SFU is for their work. On average, SFU Users find ProTed most relevant. bioCEED and MatRIC, though a higher number of respondents has frequently heard about them are evaluated as less relevant. From the younger SFUs, CCSE and ExcITEd also appear to be relevant. CEMPE and CEFIMA score low for their relevance.

Comparing the three User-Types, we find a similar picture as for the indicator 'hearing about the SFUs'. For Adopters, the SFUs are more relevant than for the two other groups. ProTed, however, is a bit exceptional from the other SFUs as all groups report significantly higher relevance of this SFU compared to the other SFUs.

Table 13: How relevant the SFU-Users find the SFUs, Question Q9.4: How relevant are the SFU listed below for you?, Mean, Values: 1 'Not at all relevant', 2 'Slightly relevant', 3 'Moderately relevant', 4 'Relevant', 5 'Very relevant'

SFU	Observer (n=267)	Adapter (n=236)	Adopter (n=55)	Total (n=558)
bioCEED – Centre for Excellence in Biology Education	1.4	1.9*	2.8**	1.8
CCSE – Center for Computing in Science Education	1.7	2.2*	2.9**	2.0
CEFIMA – Centre of Excellence in Film and Interactive Media Arts	1.4	1.6	2.0**	1.5
CEMPE – Centre of Excellence in Music Performance Education	1.2	1.5*	2.1**	1.4
Engage – Centre for Engaged Education through Entrepreneurship	1.8	2.2*	2.6**	2.0
ExcITEd – Centre for Excellent IT Education	1.8	2.3*	2.9**	2.1
MatRIC – Centre for Research, Innovation and Coordination of Mathematics Teaching	1.5	2.0*	3.0**	1.9
ProTed – Centre for Professional Learning in Teacher Education	2.2	2.7*	3.3**	2.5

*Source: CHEPS SFU-Survey 2019, Author's calculations, * Mean is significantly different from the group 'Observer' at the 0.05-level. ** Mean is significantly different from the groups 'Observer' and 'Adapter' at the 0.05-level.*

The frequency statistics underlying the means for the relevance of the SFU look similar to the results already revealed for the frequency the respondents heard of the SFUs and are included in the annex 5 (see Figure 23).

Finally, the analysis addressed to what extent the frequency that the respondents heard of the SFUs correlates with the relevance indicated (cf. Table 14). While there are quite strong correlations between the two variables for the Adopters and Adapters, these are weak among the observers. The higher correlations, however, do not state that the frequency of hearing of the SFU impacts on the relevance of the SFU for the respondents. Rather, the numbers show to what extent the frequency of the hearing of the SFU and the evaluation of the relevance of the SFU are congruent (e.g. answers would be congruent if the respondent reported to hear rarely of the SFU (choosing answer 1) and find its not at all relevant (choosing answer no. 1 in the second questions). A high number of congruences would thus lead to a high correlation coefficient and support the hypotheses that hearing more frequently of an SFU increases how relevant the respondents find the SFU. To interpret the coefficients, one needs to consider the distribution of the values included in the analysis.

Table 14: Correlation of heard of SFU and Relevance of SFU; Pearson's R-Coefficient, Question Q9.3: How frequently have you heard about the following SFU?, Means, Values: 1 'Never', 2 'Rarely', 3 'Occasionally', 4'Frequently', 5 'Very frequently' and Q9.4: How relevant are the SFU listed below for you?, Mean, Values: 1 'Not at all relevant', 2 'Slightly relevant', 3 'Moderately relevant', 4 'Relevant', 5 'Very relevant'

SFU	Observer	Adapter	Adopter	Total
bioCEED – Centre for Excellence in Biology Education	.449**	.682**	.764**	.671**
CCSE – Center for Computing in Science Education	.447**	.587**	.547**	.573**
CEFIMA – Centre of Excellence in Film and Interactive Media Arts	.330**	.487**	.479**	.455**
CEMPE – Centre of Excellence in Music Performance Education	.445**	.702**	.528**	.637**
Engage – Centre for Engaged Education through Entrepreneurship	.277**	.575**	.737**	.519**
ExcITEd – Centre for Excellent IT Education	.366**	.584**	.559**	.523**
MatRIC – Centre for Research, Innovation and Coordination of Mathematics Teaching	.541**	.660**	.785**	.663**
ProTed – Centre for Professional Learning in Teacher Education	.539**	.633**	.581**	.602**

*Source: CHEPS SFU Survey 2019, Author's calculations, ** Correlation is significant at the 0.01 level (2-tailed).*
** Correlation is significant at the 0.05 level (2-tailed).*

In detail, the correlation analysis finds for Adopters some support for stating that the frequency of hearing about the SFUs frequently leads to a higher evaluation of the SFU relevance. This seems to be less frequently the case among Observers. For them we find quite some divergence between the frequency they heard of the SFU and the relevance assigned. Based on the distribution of values we can thus assume that the frequency they heard of the SFU does not influence their evaluations of its relevance. Further, we assume that also among Adopters there is no strong relationship between these two things, and that the evaluation of the SFU relevance is not related to the frequency of the communication but to the SFU achievements.

The relevance of the SFU-initiative in comparison to other initiatives

In order to learn about how the SFU-Users evaluate the SFU initiative compared to other educational enhancement activities, the survey asked them if they are aware of other enhancement initiatives in Norway and if so, how relevant they find the SFU initiative compared to these. These results help to get an impression, what is the scope of impact that the SFU initiative has.

Every third respondent knew about some other current educational enhancement initiative in Norway. This percentage was highest among the Adopters and Adapters while rather low among the respondents who were not aware of the SFU initiative.

Table 15: Know about other enhancement activities, Percent, Question Q10.1: Do you know of any other current Norwegian initiative to enhance the quality of education in higher education institutions? These can involve national as well as institutional initiatives.

	Observer (n=267)	Adapter (n=236)	Adopter (n=55)	Not aware of SFU-initiative (n=371)	Total (n=929)
Yes	36%*	42%*	58%**	21%	33%
No	64%***	58%	42%	79%****	67%

Source: CHEPS SFU-Survey 2019, Author's calculations,
** Proportion is significantly different from the group 'Not aware of SFU-initiative' at the 0.05-level.*
*** Proportion is significantly different from the groups 'Observer' and 'Adopter' at the 0.05-level.*
**** Proportion is significantly different from the group 'Adopter' at the 0.05-level.*
***** Proportion is significantly different from all other groups at the 0.05-level.*

In total, the 283 respondents indicated 476 other enhancements initiatives. These included foremostly institutional initiatives such as teaching prizes or awards for excellent teachers. Another significant number of respondents pointed to White paper on education and the related changes in academic career schemes at some Norwegian higher education institutions implementing the excellent teaching practitioner scheme. It appears that a high number of respondents is not aware that the White paper on education and the newly established academic career schemes in education are related to the SFU-initiative. As an important actor, the respondents also mention DIKU and the funding programmes managed by DIKU. Box 1 in the annex 5 includes an overview with all mentions of initiatives that respondents view as stimulating educational enhancement in Norway.

Table 16: Comparison of SFU initiative with other education enhancement initiatives, Question Q10.4: "Please compare the SFU initiatives to the initiatives you mentioned with regard to their relevance for your work. As compared to the other initiatives, the SFU initiatives are….", Values 1 'Far less relevant', 2 'less relevant', 3 'Equally relevant', 4 'More relevant', 5 'Far more relevant'.

	Observer (n=66)	Adapter (n=83)	Adopter (n=29)	Total (n=178)
Relevance of SFU-initiative compared to other initiatives	2.93	3.38	3.30	3.22

Source: CHEPS SFU-Survey 2019, Author's calculations, no significant mean differences

The majority of respondents finds that the SFU initiative is equally relevant for their work compared with other education enhancement initiatives (see Table 16). This analysis did not reveal significant differences due to the low number of respondents. Nevertheless, it gives an impression of the significance of the SFU-initiative for the work of academic staff. We can see here that the initiative is a relevant voice in the chorus of measures to improve teaching, but it is not the first voice for all those involved in teaching. To them, especially the measures of their home institutions, which can often offer direct incentives such as money, time, support and also promotion, are important further options. It is also important to note that these institutional measures are 'closer' to the respondents and therefore more relevant to them.

Conclusions

The most important channel through which SFU-Users learn about the SFU initiative is the communication with their colleagues, also the calls for funding are a very important communication channel. Other dissemination activities done by NOKUT were rarely used. The SFU-Users found this information moderately useful.

While the SFU-initiative is known, a few SFU-Users never heard of any specific SFU. The number of SFUs the SFU-Users already heard of differs strongly across the SFU-Users. While many Adopters know all current SFUs, most Observers only know one or two SFU. In total, SFUs that work in cross-disciplinary areas, such as Matric, ProTED or CCSE are more popular among the respondents than the SFUs that have a more disciplinary specific focus such as CEMPE or CEFIMA. Also bioCEED is well known. The SFU-Users also evaluated the relevance of SFU with cross-disciplinary focus higher.

Nonetheless, there is no relationship between the evaluation of the relevance of an SFU and the frequency SFU-Users heard of the SFU. Rather, it seems that the evaluation of the relevance is strongly related to the content of the SFU, and not to the frequency of dissemination.

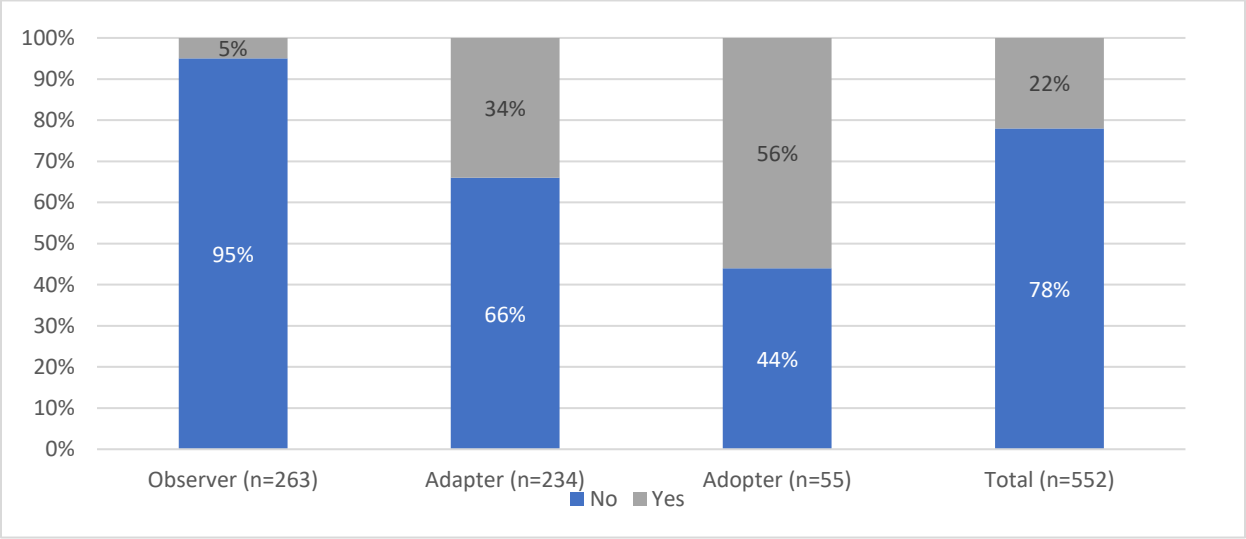
6.6 Using SFU achievements and innovations

One of the main goals of this study is to find out to what extent the SFU-initiative stimulated educational enhancement in the Norwegian higher education sector. One main approach to answer this question was to assume that SFU act as innovation hubs that disseminate education innovation and other output that will be used by individuals at other higher education institutions in Norway. In the survey we therefore also collected data on the use of SFU achievements and innovations through respondents who are not part of an SFU. In the following section, the results of these data will be presented. First, we will study if the SFU-user types know any specific SFU achievements, and through which communication channels they learned about them. Second, we will investigate, the impact of the innovations, i.e. if the SFU-user types use them to enhance their own teaching practice, and if so, for what purposes. Third, we will investigate how the respondents evaluate the adoptability of the SFU achievements, and what the role the institutional context has when using the SFU innovations. Finally, this section provides insights in how relevant the SFU users find the innovations compared those from other enhancement initiatives.

Came across any achievements and innovations

From all SFU-Users 22% already came across any information, knowledge or description of teaching enhancement practices that were connected to an SFU. Among Adopters, this was mentioned by more than half of the respondents. From Observers only 5% report that they heard of such a specific SFU output.

Figure 11 Already came across any information connected to an SFU, %, Question Q11.1: Did you come across any information, knowledge or descriptions of teaching enhancement practices that were connected to an SFU?



Source: CHEPS SFU-Survey 2019, Author's calculation, sig ≤ 0.05

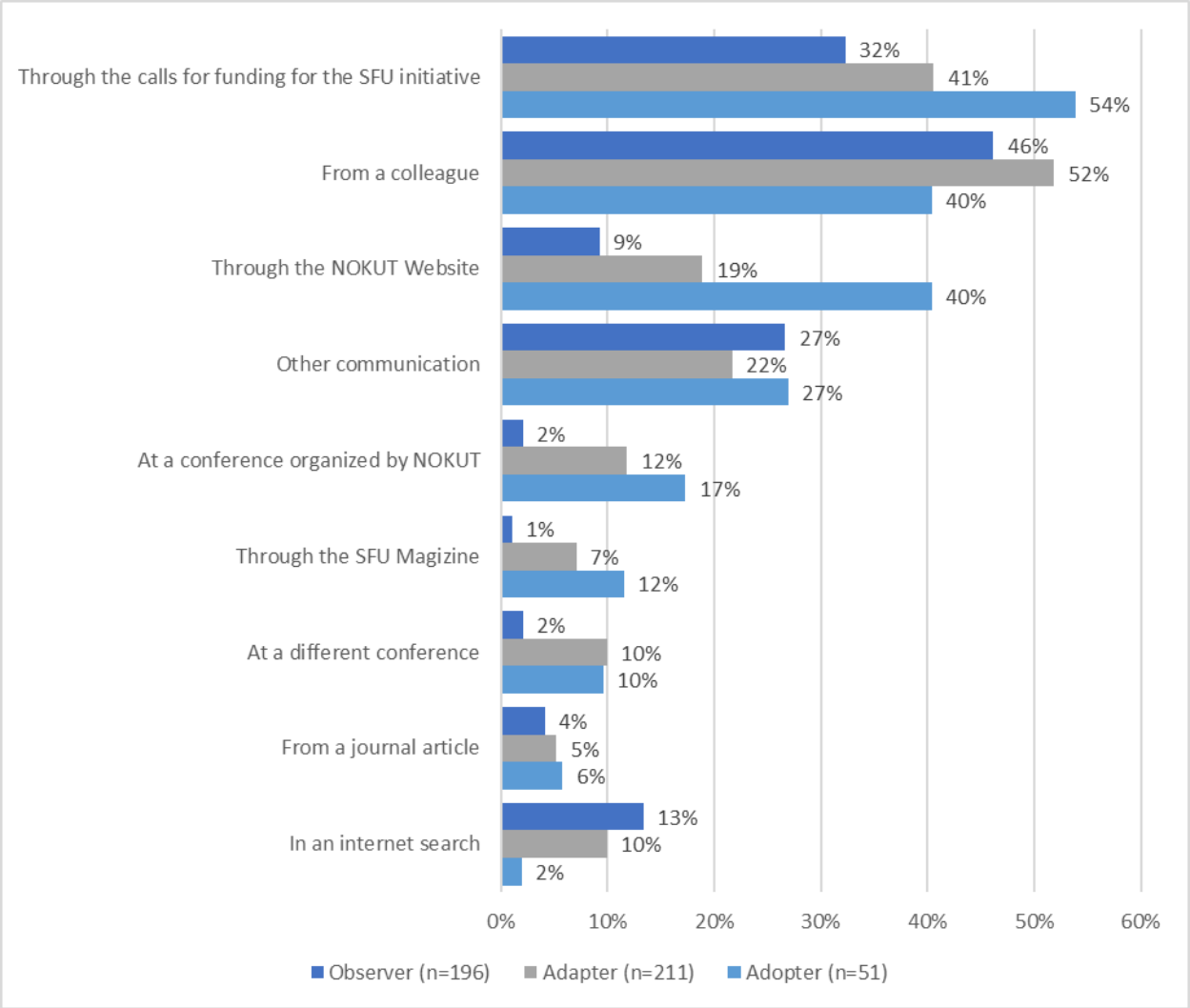
Which achievements and innovations

The respondents' answers to what specific innovations or achievements they came across, are less specific than we hoped for, i.e. the respondents hardly point to a specific SFU achievement. Most respondents indicate that they participated in dissemination activities of the SFU such as presentations and conferences, or they came across SFU publications. When it comes to 'classroom-innovations', respondents report more frequently approaches such as blended learning, digitalisation and a stronger student orientation of the learning and teaching. Some respondents also mention only the SFU name, which is difficult to interpret. For illustration we included a box in the Annex 5 with all answers with which the respondents refer to SFU achievements (cf. see box 2 in Annex 5). Some respondents also refer to specific SFU events, they frequently mention trainings or conferences that were hosted by some of the older SFU. In particular trainings offered by Matric and Proted are mentioned, further respondents refer to conferences hosted by Bioceed. It also has to be stated here that some respondents did not understand the question as intended but pointed to their own SFU application.

How SFU-users learn about the SFUs achievements

The calls for proposals for the SFU initiative and word-of-mouth communication are the most common ways the SFU users learned about SFU achievements, i.e. about information, knowledge or practices that are connected to an SFU or the SFU-initiative. Communicating with colleagues about the initiative is an essential channel for spreading knowledge about SFU achievements. Adopters have also frequently used the NOKUT website (see Figure 12).

Figure 12 Learned about SFU achievements through…, Question Q11.2 "How did you learn about these SFU achievements?", in %



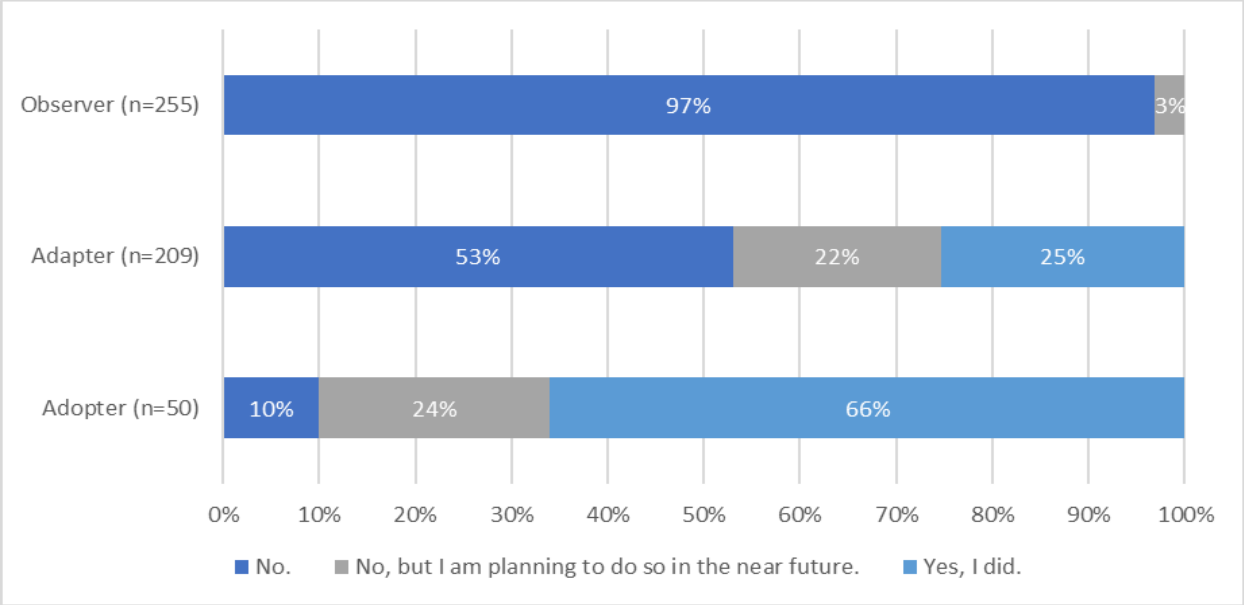
Source: CHEPS SFU-Survey 2019, Author's calculation, sig ≤ 0.05

Compared to these three channels, all other channels have not been frequently used, and thus play a minor role in spreading information. The communication channels mentioned as other communication mostly refer to email communication. Unfortunately, it remains unclear who was involved in the email communication. Only very few open answers point to the direct contact between SFU users and the SFUs.

Impact of the innovations – change of teaching practice

As expected, the SFU-achievements have a very different impact in the SFU-user groups. Observers appear to not have any interest in changing their teaching practice based on the SFU achievements. None of them changed the teaching practice already and only 3% plan to do so soon. 97% do not plan to do this. Among Adapters and Adopters, the picture is very different. Nearly half of the Adapters and 90% of the Adopters reported that they have or plan to use the SFU achievements to change their practices.

Figure 13 Change Teaching Practice individual level, %, Question Q49 "Have you changed your practices or developed teaching and learning activities based on information or results from the SFU?"

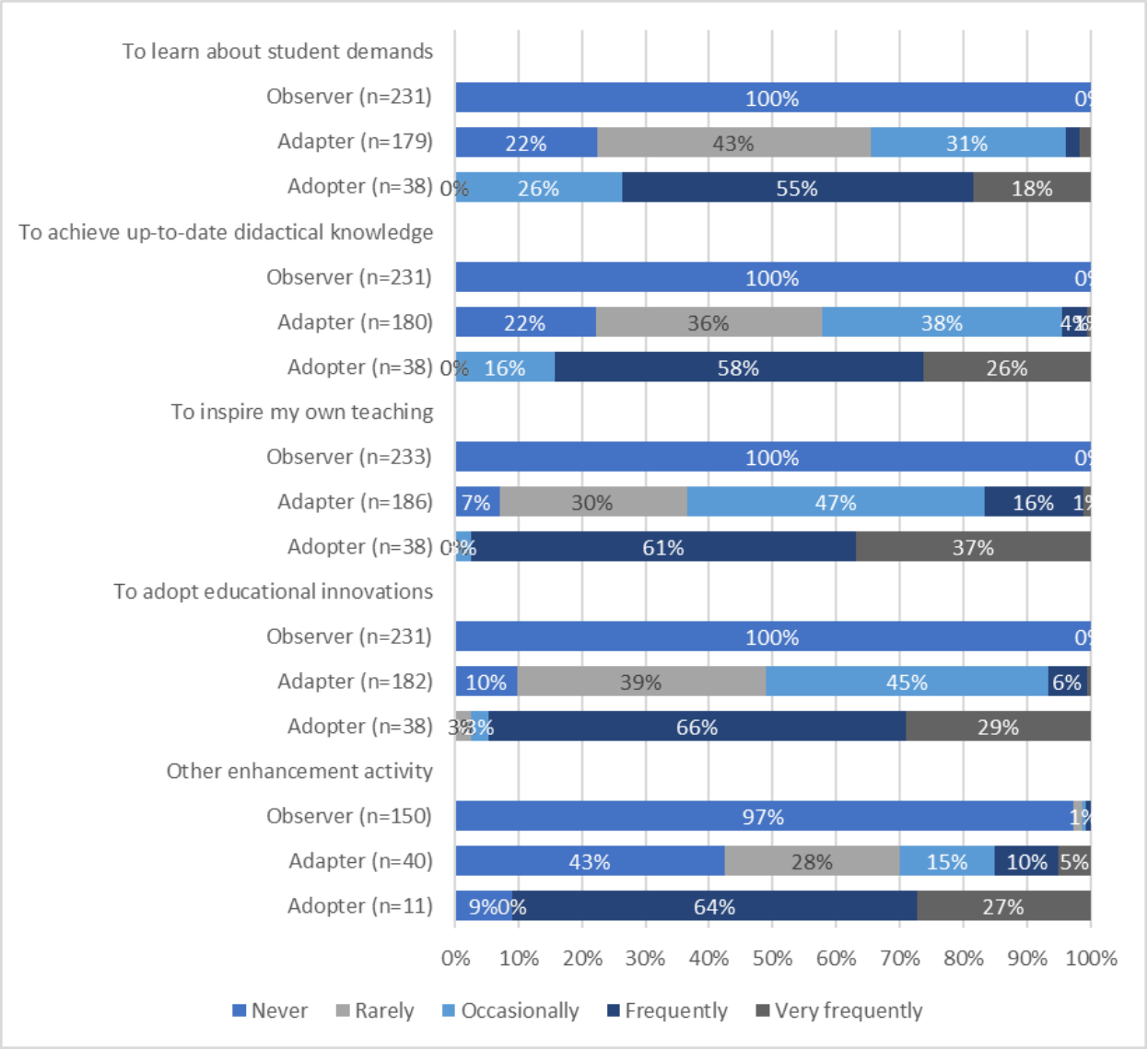


Source: CHEPS SFU-Survey 2019, Author's calculations, sig. 0.000

Comparing these results to the general engagement for educational enhancement we must state that the SFU achievements have a very different relevance for the three SFU-User groups (see section 6.3; Figure 6). The achievements do not seem to be relevant to the Observers. While more than 80% of the Observers already engaged in enhancing education, they hardly used the SFU achievements. To adopters the SFU achievements are far more relevant. Nearly all of them engaged in educational enhancement, and 90% referred to the SFU achievements. The analysis below of how respondents perceive the adoptability of the SFU achievements, and what factors are relevant for using them, will hopefully shed some light on this difference between the user groups.

Figure 14 sets out the areas in which the respondents apply the SFU achievements. Observers hardly apply SFU achievements in any of the areas. For Adapters and Adopters the improvement of their teaching qualification is an important area to apply them: Among the teaching staff at Norwegian Higher Education Institutions 84% of the Adopters report that they (very) frequently use the SFU achievements to attain up-to-date didactical knowledge, and even 98% report that they (very) frequently use it to inspire their own teaching. Learning about student demands is far less relevant, as only 73% mention this.

Figure 14 Applying SFU-achievements, Question 13.3B: Teaching Staff: How frequently do you apply SFU stuff to the enhancement activities listed below? %, Values 1 'Never', 2 'Rarely', 3 'Occasionally', 4 'Frequently', 5 'Very frequently'

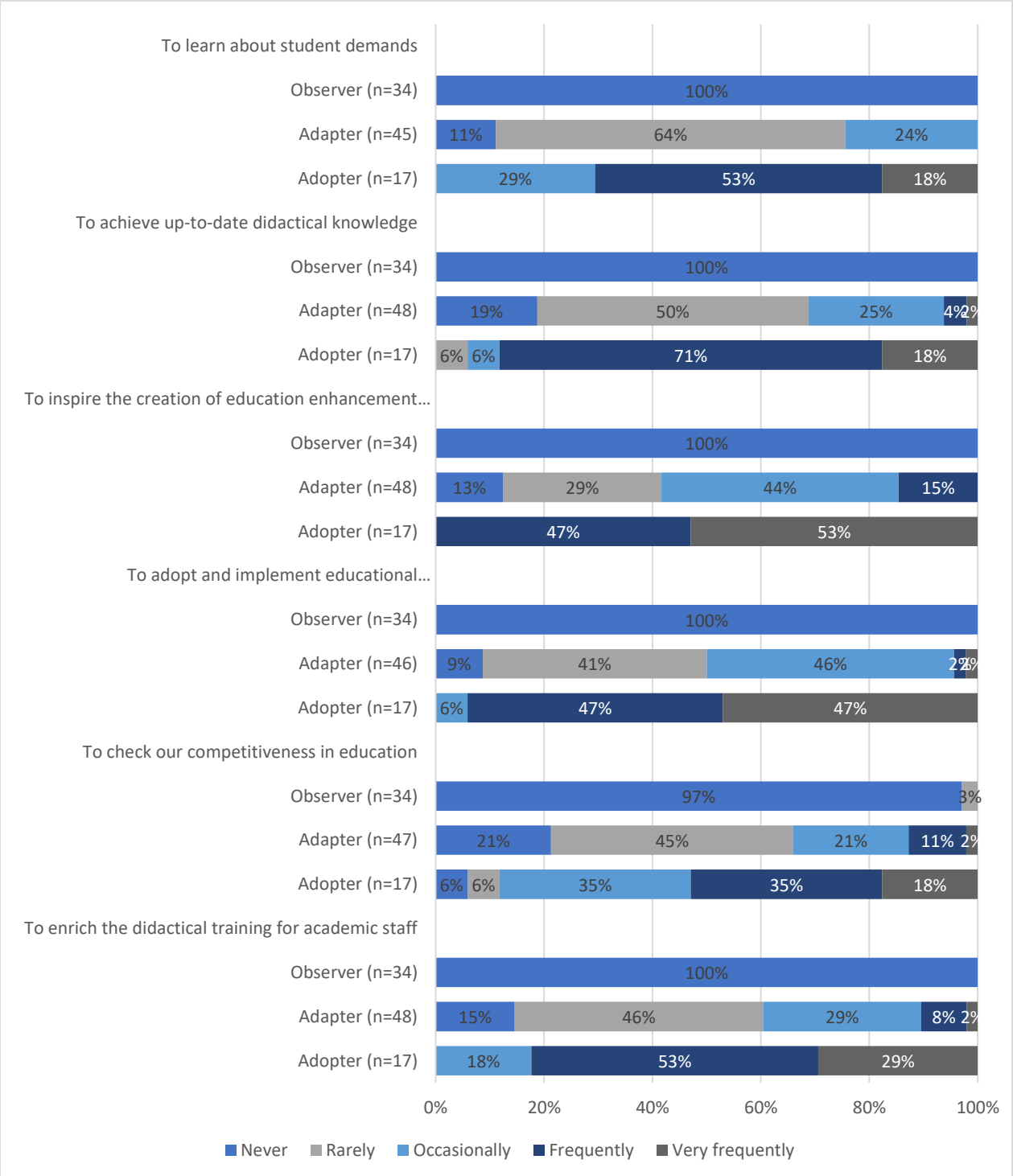


Source: CHEPS SFU Survey 2019, Author's calculations, sig. ≤ 0.05

Figure 15 shows results for a similar question that targeted the institutional leadership and the educational advisors. The inspiration of the teaching was also an area that was mentioned by all adopters in this staff groups. From these staff groups, the adopters apply the SFU achievements less frequently to learn about student demands and to check their competitiveness in education.

Some of the 'Other' areas mentioned where the respondents apply SFU achievements are the development of course or study programmes, or the development of own education innovations. Also, the inspiration of own research was stated. Further, a few respondents indicate that they apply SFU achievements to stimulate discussion among the (teaching) staff.

Figure 15 Applying SFU achievements, Question 13.2AC: Educational advisors and institutional leadership: How frequently do you apply information, knowledge or practices that are connected to a SFU or the SFU initiative to the enhancement activities listed in the table below? %, Values 1 'Never', 2 'Rarely', 3 'Occasionally', 4 'Frequently', 5 'Very frequently'



Source: CHEPS SFU Survey 2019, Author's calculations, sig. ≤ 0.05

Evaluation of innovations

The framework mentions that the adoption of educational innovations also depends on how smoothly they can be implemented in a context that is beyond the actual context in which it was created. To find about how costly the SFU-users find making the innovations usable in their context, they evaluated the innovations regards the:

- Modification of the innovation needed
- Change of their own teaching practices needed
- The amount of collaboration needed during the adoption of the innovation.

On average, the SFU users were modest in their evaluations of the effort needed to make the SFU output usable in their context. On average they believe that a moderate effort is needed to adjust the SFU output to their contextual challenges, an also moderate effort should be invested to prepare themselves to be ready for the use of the innovations, and finally they expect a slight effort with regard when collaborating with the creators of the SFU output. (Table 17)

Interestingly, Adopters expect more efforts related to the innovations than the other two groups. They expect that teaching practices need to be changed to a more than moderate extent. Observers expect that these need to be changed to an only slight extent.

Table 17: Adoptability of SFU achievements, Mean, Question Q14.2AC Please rate to what extent SFU enhancements or other SFU output…, Values 1 'Not at all', 2 'To a slight extent', 3 'To a moderate extent', 4 ' To a high extent', 5 'To a very high extent', 6 'To a too high extent'; Question Q14.2B Please rate to what extent SFU enhancements or other SFU output…, Values 1 'Not at all', 2 'To a slight extent', 3 'To a moderate extent', 4 ' To a high extent', 5 'To a very high extent', 6 'To a too high extent'..

To what extent SFU enhancements or other SFU output…		Observer	Adapter	Adopter	Total
…need to be modified in order to be usable in your institution/in your teaching?	Mean	2.7	3.1	2.8	3.0
	n	46	132	45	223
…require a change of the/your teaching practices to be adopted?	Mean	2.0	3.0	3.2	2.8
	n	50	141	46	237
…require that you closely collaborate with the developers from the SFU in which it was created/closely collaborate with the creating SFU when adopting it?	Mean	2.1	2.5	3.1	2.5
	n	54	136	48	238

Source: CHEPS SFU Survey 2019, Author's calculations, Significance test not available

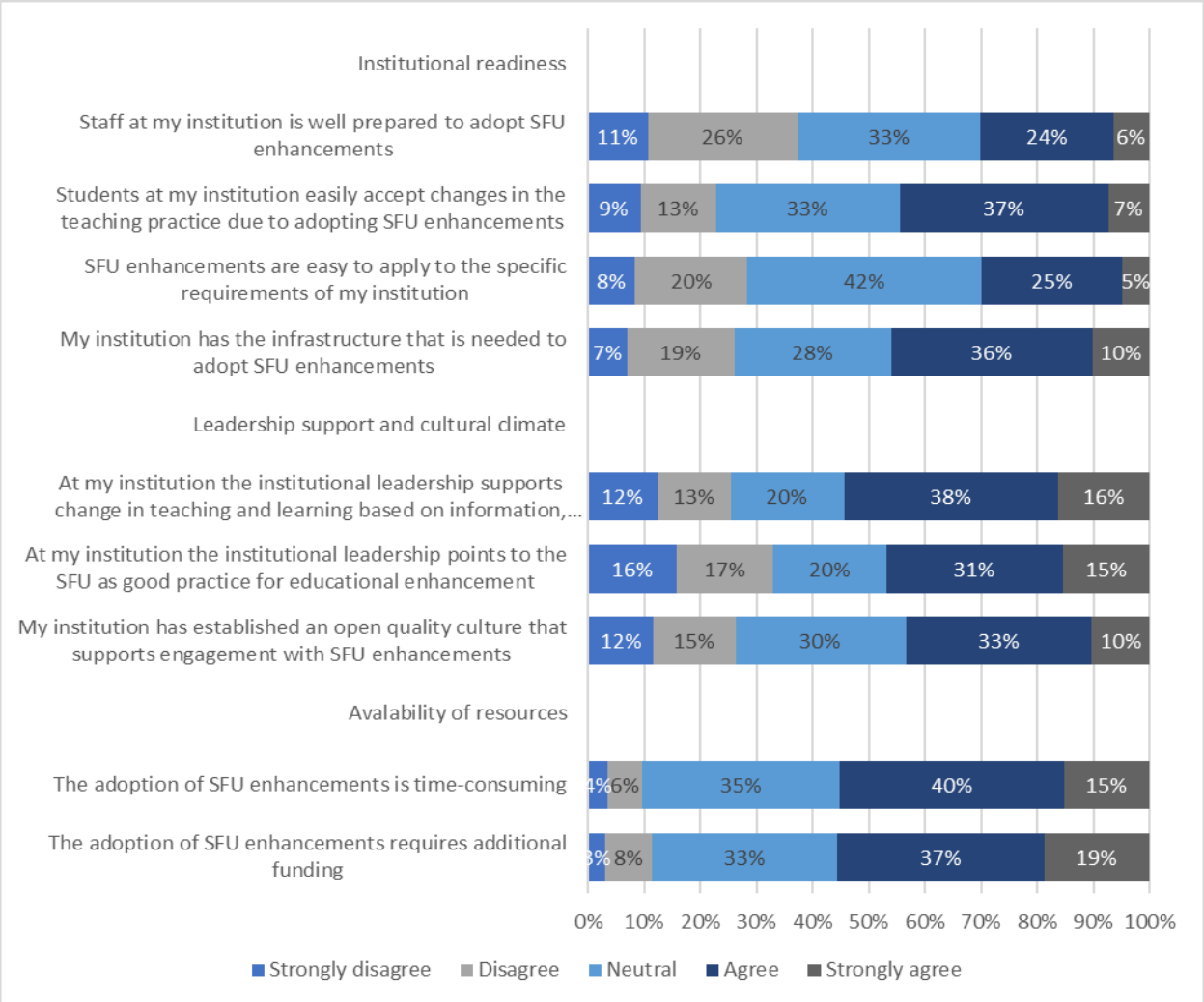
At a first glance it appears striking that the adopters expect higher efforts and costs when adopting the SFU enhancements or output. Here one would expect that observers are reluctant to adopt this output due to the expected higher costs, and that Adopters would rate the costs of adoption much lower. However, when interpreting the results, one must consider that Adopters already gathered experience in adopting SFU output while Observers did not engage in this (yet). This means that Adopters are more aware of the efforts needed to use SFU output. Though they rate the efforts higher than others, Adopters don't find that using the SFU achievements needs too high efforts. Also, adopters appear to use a different strategy compared to the other users, rather than changing the enhancement, they recognise the need to adjust teaching practices or to collaborate with the SFU that created the output.

Evaluation of the institutional aspect supporting the use of SFU enhancements and other SFU output

Section 6.3 already investigated how the SFU-users in general evaluate institutional aspects that play a role when adopting educational innovations. This analysis revealed three dimensions which underlie the respondents' evaluations: the perception of the institutional readiness, the Leadership support and cultural climate and the availability of resources.

In the following, we will analyse how respondents evaluate these dimensions regards the use of SFU enhancements and other output. The detailed frequency statistics are included in the Annex 5 in Figure 25. In total, one third of the SFU-Users takes a neutral position when evaluating the different institutional aspects. Compared to the evaluation how in general institutional aspect determine the adoption of educational innovations, a smaller percentage agrees to the items. For example, in total 37% disagree with the statement that staff is well prepared for the adoption of SFU enhancements (see Figure 16).

Figure 16 Evaluation of institutional aspects for the adoption of SFU enhancements, %, Question Q15: How do you rate the aspects below for the adoption of SFU enhancements or other SFU output in your institution or in your work? Values -2 'strongly disagree', -1 'disagree', 0 'Neutral', 1 'agree', 2 'strongly agree'.



Source: CHEPS SFU Survey 2019, Author's calculations, For institutional readiness and Leadership support and cultural climate sig.=0.000, no significant differences between SFU-User Types Availability of resources.

This is mostly true for the Observers were more than half believe that staff is not well prepared for the adoption of these enhancements. Also regards the other aspects related to the institutional readiness, Observers are more sceptical than Adapters and Adopters. Observers are also more negative about the leadership support and institutional quality culture than the two other SFU-user types. For a higher percentage of the Observers also the availability of resources seems to be difficult.

The gap between the evaluations of the Observers and the Adapters and Adopters regards institutional aspects is quite interesting. The different perceptions might be related to personal traits such as being reluctant to innovations and less interest in trying out new techniques. Unfortunately, we cannot follow up on these variables. However, Observers also seem to be less well embedded in the institutional developments around teaching or education. A number of reasons might be related to this, for example their department does not work intensively on educational enhancement, they experience a high satisfaction with their current teaching. Observers might also be more interested in research and research activities and focus on these developments.

Comparing the mean evaluations of the institutional aspects when adopting SFU enhancement to those regards adopting educational innovation in general respondents are more modest (see also Table 12 in section 6.3). The negative mean evaluations of the Observers point to their more sceptical attitude towards the readiness of the institution and the availability of resources (see Table 18).

Table 18: Evaluation of institutional aspects for the adoption of SFU enhancements, Means for dimensions, Question Q15: How do you rate the aspects below for the adoption of SFU enhancements or other SFU output in your institution or in your work. Values -2 'Strongly disagree', -1 'Disagree', 0 'Neutral', 1 'Agree', 2 'Strongly agree'

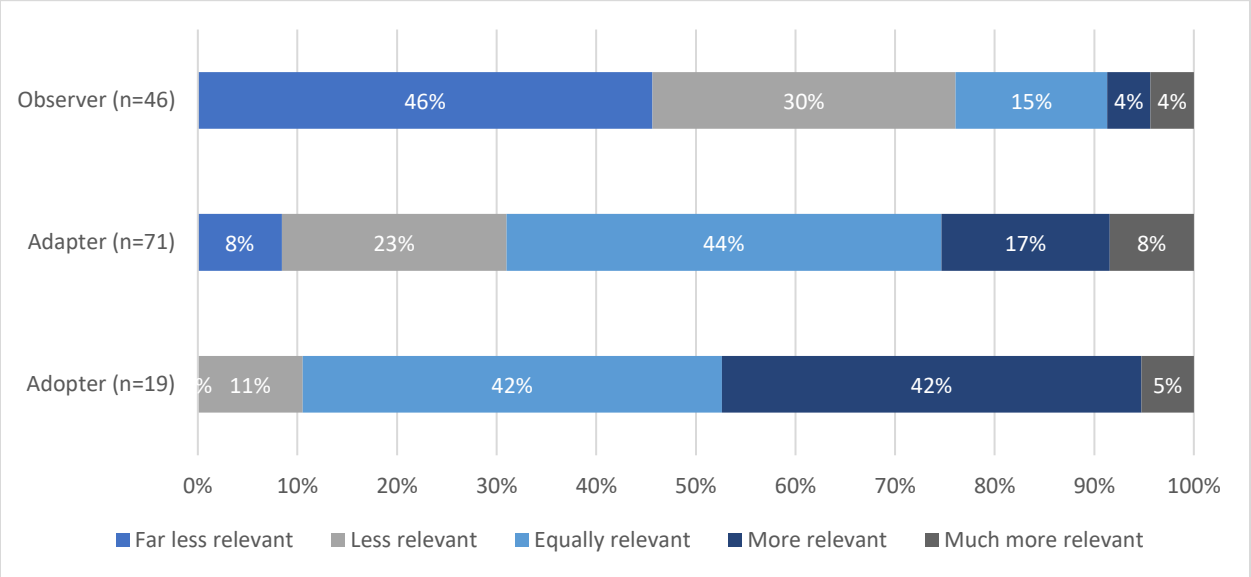
		Observer	Adapter	Adopter	Total
Institutional readiness	Mean	-0.43	0.14	0.48	-0.01
	n	129	197	50	376
Leadership support and cultural climate	Mean	-0.48	0.40	1.07	0.13
	n	170	208	50	428
Availability of resources	Mean	0.73	0.56	0.48	0.60
	n	86	185	50	321

Source: CHEPS SFU Survey 2019, Author's calculations

Comparing the Relevance of SFU achievements

The more sceptical attitude is also reflected by the respondents' opinions when comparing the relevance of SFU enhancements with other educational enhancements. In particular Observers find the SFU enhancements less relevant, nearly half of them even far less relevant.[12]. Again, when interpreting these results, one has to consider that the Observers did not engage as intensively with the SFU achievements as the Adapter and Adopters did. Their answers might thus be less based on experience but show more strongly their perception. But also, the answers of the Adapters and Adopters do not point to a much stronger relevance of the SFU enhancements. Nearly half of these respondents find the SFU-enhancements equally relevant when comparing it with other enhancements. To them SFU-enhancements thus seem to be one factor stimulating their educational enhancement activities, but to most respondents the SFU-output does not seem to be the most important source.

Figure 17 Comparing the relevance of SFU enhancements to those of other enhancements, %, Question Q12.4 Please compare the SFU educational enhancements to the non-SFU educational enhancements you mentioned with regard to their relevance for your work or for your institution. Values 1 'far less relevant', 2 'Less relevant', 3 'Equally relevant', 4 'More relevant', 5 'Much more relevant'



Source: CHEPS SFU Survey 2019, Author's calculations, sig. 0.000

Conclusions

A few SFU-Users were able to state specific SFU-enhancements, but most of them had difficulties verbalising them. A lot of the respondents learned about the SFU-enhancements through the Call for application for the SFU-initiative and through exchanging with their colleague. Adopters also used the

[12] The low number of respondents to this question is due to a filtering in the questionnaire. This question was only presented to respondents who mentioned enhancements that were not connected to an SFU.

NOKUT website to collect information on specific SFU enhancement. The other NOKUT dissemination activities were mentioned by only very few SFU-users.

The SFU enhancement hardly stimulated change of individual teaching practices. In particular Observers that they did not change due to SFU enhancements. Among Adopters and Adapters more have changed their teaching practice, but this number does not amount to a critical mass.

Surprisingly, the SFU-Users do not evaluate the SFU enhancements as difficult to adopt. This is foremost voiced by the Observers who did not gather any experiences in adopting the SFU enhancement. Adapters and Adopters are more reflective regards adoption and point that some effort is needed to make use of them.

Also, SFU-Users are not fully convinced that selected institutional aspects allow a smooth adoption of SFU enhancements. While they find that their institutional context is well suited for the adoption of education innovations in general, they have a very different view on the adoption of SFU enhancements. The SFU enhancements are perceived as less relevant compared to other enhancements by most of the Observers. Adopters and Adapters evaluate them as equally relevant.

Overall, the survey results indicate that a climate has been created at Norwegian universities, where there is an openness to the issue of improving teaching and the use of educational innovation. However, SFUs are not the first source of information for all respondents when it comes to improving teaching. Respondents who work in university management or as educational advisors are particularly interested in the SFU. For these persons, who are often also adopters, also generally show a high motivation for improving teaching.

Since we, unfortunately, cannot include the institutional background of the respondents in the analysis, it is difficult to determine how the context of the respective universities influences the respondents.[13] Unfortunately, we can only understand what institutional influences they consider important from the perspective of the individual respondents. Observers find the availability of resources relevant and point out that the lack of these resources makes it difficult or even blocks a commitment to improving teaching. Adopters and adapters consider it more important that the necessary conditions have been created in the university (such as further training of teachers or acquisition of the necessary technology) so that enhancement measures in teaching can succeed. For these groups, it is also essential that an appropriate quality culture has been created and that the university management supports improvement measures.

[13] Unfortunately, the data also do not allow for the tracing and analysis of internal connections resulting from the integration of the respondents in social networks.

7. Conclusions

To support innovation and enhancement of education in Norwegian higher education, the Norwegian Ministry of Education and Research established a policy for "Centres for Excellence in Higher Education" (the SFU initiative) as a focused and long-term effort in 2010. The ambition of the initiative is to contribute to the development of excellent quality in higher education and to highlight that teaching and research are equally important activities for universities and university colleges. One major goal of the SFU scheme is that the centres contribute not only to the enhancement of the quality of teaching and learning at their host institutions and consortia partners but also stimulate other higher education institutions in Norway (and beyond) to engage in these activities.

This study focusses on the extent educational innovations disseminate in the Norwegian higher education system. The following research question guided this study:

1. Whether, and if so, how and to what extent, the SFU initiative has stimulated enhancement in teaching and learning (education) in the Norwegian higher education sector?
2. To what extent has NOKUT's management of the initiative contributed to and/or hindered this enhancement?
3. Based on 1 and 2, what are the lessons learned for DIKU's management of the SFU initiative from 2019 and NOKUT's work with stimulating enhancement of teaching and learning in the Norwegian higher education sector?

In these conclusions, we will synthesise our findings to answer the three questions.

7.1 Enhancement in teaching and learning

The question of how and to what extent the SFU initiative has stimulated enhancement in teaching and learning cannot be answered unambiguously. Already the mid-term evaluation observed that the SFUs have the potential to stimulate enhancement across the system, but that this was happening more erratic as there was no explicit Theory of Change guiding the SFU initiative. In order to have an impact, the SFUs have developed strategies to disseminate their achievements and innovations. Unfortunately, they did not establish ways to monitor and follow-up their dissemination to learn about their impact. The scoping interviews revealed that though having a dissemination strategy, some SFU respondents were not able to identify their most important innovations or achievements in recent years. They were also not aware of what institutions or what persons were using their achievements. Also, the actual dissemination frequently did not include the motivations or needs of potential adopters but concentrated on the achievements and their characteristics. This lack of information makes it difficult to determine whether the innovations and achievements of SFUs have contributed to enhancing education at the system level in Norway. Instead, its impact has to be reflected at a more general level, i.e. whether or not education enhancement became widely accepted and to what extent teaching and learning gained in prestige.

Against this background, we can conclude from the study results that the SFU initiative has contributed to stimulating enhancement in teaching and learning in the Norwegian higher education sector. Already prior evaluations pointed to the achievements of the mature centres, that have been adopted widely by the higher education sector, as the concept of university schools that ProTed developed and BIOCEED's model for evaluating and rewarding teaching staff that fed into the "excellent teaching practitioner". The evaluation of MaTRIC showed that it had an impact throughout its university.

The survey shows that 63% of the survey respondents knew the SFU-initiative, and – accordingly – 37% did not know it. Also, the survey results reveal that respondents who know about the SFU initiative and have had frequent contact, are more positive about its relevance, use the achievements more often and perceive the institutional conditions for education enhancement more positively. Our survey results indicate that especially institutional leaders and educational advisors know about the SFU initiative and use SFU achievements frequently: 60% have already used SFU achievements. Also, most of the professors and academic staff with teaching duties know about it. From them, only around 30% already used SFU achievements, which is considerably lower. To find out how the respondents make use of the SFU achievements and what characterises these different users we distinguished the following User-types: Adopters (6%), Adapters (25%), Observers (29%), and Not aware of the SFU-initiative (40%).

The distinction of Adapters and Adopters foremost represents how frequently the SFU-users have actively engaged with the SFUs and their innovations but both User-types might have adapted or even adopted the SFU enhancements. However, the profile of these two types differ. Adopters are predominantly institutional leaders and educational advisors. Adapters are more often professors and teaching staff.

Both groups report that educational enhancement is very important in their institutions. Important drivers for engaging in the enhancement and innovation of teaching and learning are personal interests in improving teaching skills, or their wish to try out a new educational approach. Adapters and Adopters assess the institutional readiness and overall climate for enhancement of teaching positively, and they are aware that enhancement is dependent on the provision of resources and institutional support.

A third User-Type we identified among the survey respondents are the Observers. These respondents know about the SFU-initiative but never used an SFU-achievements. They are the biggest group we identified, and their percentage is highest among the professors and other academic staff (more than 50% are Observers). However, Observers are also engaged in education enhancement but use other resources than SFU achievements. Compared with Adapters and Adopters, Observers perceive the readiness of their institutions and the availability of resources more often as limited.

The fourth group we distinguished are those not aware of SFU initiative. This latter group of respondents are foremost rather young staff at the start of their careers, with and without teaching duties.

Though these results indicate that SFU initiatives have stimulated enhancement, it might be that the SFU initiative is part of a broader engagement for enhancement of education. While most of the Adopters and Adapters perceive an increase in the value given to education over the last five years, more than 50% of the observers and those not aware of SFU did perceive such an increase. Also, only very few respondents could mention specific SFU innovations or achievements. One third also mentioned other educational enhancement initiatives in Norway, often initiatives from their institute, and sometimes initiatives related to the SFUs.

Furthermore, we see that most of the Adopters and Adapters have already engaged in the enhancement of education. Nevertheless, this is true also for Observers, though there is a difference between these groups. Adopters and Adapters have a higher motivation for educational enhancement, while Observers often indicate that a lack of resources and unfavourable institutional conditions hinder them from enhancing their education.

The answer to the question of whether the SFU initiative has stimulated teaching enhancement is somewhat negative if we look more specifically at the impact on professors and teaching staff. Less than

50% of them are Adopters or Adapters. Regarding the use of SFU achievements, only a (small) group of respondents – mostly Adopters – report that they (very) frequently use the SFU achievements. One important motivation for them is to achieve up-to-date didactical knowledge (84% of the adopters apply SFU achievement in this area). Nearly all Adopters, 98%, report that they (very) frequently use the achievements to inspire their teaching. Learning about student demands is less relevant; 73% mention this.

If we combine these quite mixed results with those of our literature research, they are easier to understand. The dissemination and diffusion models that guide our study focus on intended dissemination and the explicit adoption of achievements by users. Our study revealed similar results as presented in the literature review. That is, dissemination and diffusion mostly get through to Adopters and the Adapters who are anyhow interested in improving their teaching. Reaching out to the Observers is much more challenging as they do not find the SFU achievements relevant to them. We found that Observers are very much interested in enhancing their teaching but they experience several hindrances such as a lack of institutional readiness, lack of resources, in particular time to engage in enhancement, and do not find that the achievements would fit their needs.

Again, in line with findings from the literature review, our results also show that among some staff there is a lack of awareness of what changes, resources and further efforts are needed to adopt the SFU achievements. Many respondents are aware that adoption and enhancement require a lot of individual and organisational changes and learning, but currently do not know how to start the process. Adopters and Adapters are already more familiar with the associated change processes, are much more aware of this.

These findings fit within the general pattern found in the literature review that the diffusion of innovations in teaching and learning depends strongly on individual motivations and assessments of innovations, but also on a close engagement of teaching staff implementing the enhancements. A major result, therefore, is, that innovations reveal impact within their closer community or network of practitioners as well as among international peer groups, but have an only little visible impact at the national level. CETL initiatives in other countries struggled with similar problems and have not found final solutions yet.

Another perspective on the impact of dissemination

One could easily infer from these findings that the CETL model in general and probably also the SFU do not have the expected broad impacts. However, the results of this study allow us to look further and move beyond the usual pattern of diffusion that most studies in higher education innovation use. These dissemination and diffusion models suggest that diffusion is a process of accumulated individual decisions to adopt a specific enhancement, facilitated or constrained by institutional contexts.

Several of our findings suggest that the SFU scheme has induced a specific pattern of diffusion which is worthwhile to explicate, even though we need to connect dots from our findings more speculatively. However, at least it helps to understand some of the findings that do not fit the mainstream innovation model.

Our analyses of applications and evaluation documents revealed that the model of innovation → dissemination → impact should not be taken too linear. A model which suggest that an SFU develop specific types of enhancements is more realistic as the SFUs generate ideas as well as concrete educational innovations. Intended dissemination occurs through several channels (web, social media, scientific

journals, popular magazines, online or face-to-face workshops, conferences, interviews). Some of these communications link to concrete achievements, others may communicate overall insights and expertise. The uptake of this knowledge requires staff who practice teaching to adapt it to their needs. This uptake is mostly a complicated process and the specific nature of the original innovation might be lost in the process. Therefore, it might become unclear, to what extent an innovation was adapted and what the actual contribution of the adapter is. At the institutional level, however, less adaptation is needed as institutional leaders and education advisors can adopt SFU ideas and insights at a more abstract and strategic level.

Synthesising these different findings, we can conclude that apart from reaching out to networks or communities of teaching practitioners, SFU's have also successfully disseminated their findings to actors with key roles within their institutions as members of the institutional leadership and the educational advisors can influence the organisation of education. This suggests that institutional support is not just a facilitating factor in the dissemination of teaching enhancements in higher education, but that the institutional leaders and educational advisors play an important role in the dissemination itself. This institutionalised route is visible for ProTed's model of the university schools and bioCEED's model for the evaluation and reward of teaching staff. Both became national standards.

Also, though we do not have much evidence, we would hypothesise that within institutions the leaders and educational advisors have adopted and adapted teaching advancements not just privately, but have canvassed the idea of enhancement in the didactical approach and organisation of courses, teaching programs and other parts of the organisational fabric that supports quality work in higher education. As said, whether and to what extent that has happened cannot be concluded directly from our findings.

This alternative dissemination model that takes the role of actors at the organisational level much more significant also relates to a finding of the document analysis. That is the need for systematic dissemination strategies for SFU's. One of the evaluation panels concluded 'the Centres would benefit from developing more explicit models for disseminating the innovative outcomes of their activities. Crucially, these should focus on how they expect their approach to dissemination to lead to changes in the educational practices…' (Expert Panel, 2017, p. 28). In the literature review, we found that experiences from other countries also revealed the importance of such impact models and that programme management can play a pivotal role in this.

7.2 NOKUT's role in realising impact

The scoping interviews made clear that the NOKUT management took an active role in the SFU initiative, which was very much appreciated by most of the interviewees. Only a few respondents would have preferred NOKUT to act more at a distance. Critical remarks included complaints about paperwork, lack of guidance therein and budgeting templates, but these are all outside the scope of this study. What is of interest here is the role of NOKUT management in enhancing dissemination.

While there are not many systematic studies of the role of funding bodies and programme management in the dissemination of innovations in higher education, studies on SFU like initiatives in other countries made clear that programme management is essential. From their experiences, we identified five possible ways of stimulating dissemination:

1. Through the selection processes programme management can select those initiatives that have appropriate dissemination strategies;

2. Programme management can play a pivotal role in raising awareness about the need for innovation in higher education and increasing excellence in teaching in learning;
3. Programme management can develop an infrastructure for knowledge exchange, knowledge building and continued dissemination of project results;
4. Programme management can develop a Theory of Change[14] at system level to guide its strategic choices, own programme activities and interventions.
5. As a result of the Theory of Change, programme management can develop a varied set of projects that address different aspects and phases of the diffusion process of innovation.

The first statement is, to some extent, self-evident, but it is complicated to implement it in practice. Most initiatives have dissemination strategies among their requirements, but formulating and assessing the quality of these strategies ex-ante is difficult. From the scoping interviews and the document analyses, we learned that actual dissemination activities often deviated from the planned ones, sometimes took more time, and evaluation reports recommended a more strategic approach to dissemination. NOKUT learned from this, and required, to the surprise of some, in the second phase such strategies.

From the survey, we can conclude that the existence of the SFU initiative already raised awareness about teaching excellence. Adopters and Adapters learned about the initiative already from the Call for Applications and also list the NOKUT website as a source for learning about the initiative. NOKUT did also have its dissemination channels as part of the programme management. These included a website, the SFU Magazine, podcasts, reports and conferences. While the survey results indicate that respondents did not use most of these channels frequently, Adopters and Adapters evaluated these either as somewhat useful or as useful. Adopters valued the SFU Magazine and the NOKUT-Conference significantly better than the other groups. The scoping interviews suggest that also the SFUs do not consider these dissemination channels as really important or useful.

They did, however, appreciate the role of NOKUT in creating a network among SFUs. This was a conscious strategy by NOKUT, taken as a lesson from an intensive analysis of the HEFCE CETL initiative when the SFU programme was initiated. In contrast to the UK example, in which CETLs were more lonesome warriors, the SFU intended to create a coherent network among the SFUs. The idea that the implied inter-disciplinary learning is useful got diverged responses in the scoping interviewees. Some interviewees consider enhancement to be predicated on the social organisation of academic disciplines, as disciplines have their ways of teaching and learning. However, other interviewees maintained that there was nothing disciplinary-specific about the enhancements developed in the SFU. The latter position seems to be supported by the survey results, that show that Adapters have in average heard of 3.2 SFUs and Adopters of 6.2 SFUs. Moreover, we found that SFU-users seek more often information of SFUs that work in cross-disciplinary areas and provide achievements that are useful for a broader community.

[14] A Theory of Change makes explicit through a comprehensive description how and why a desired change is expected to happen in a particular context, and thus what activities are needed to make the initiative a success.

The fourth and fifth ways of enhancing dissemination by programme management suggest that developing a Theory of Change at programme level may help to focus on those activities which are more effective. The document analysis made clear that the SFU initiative has moved to a stage in which programme management can learn from the first stages to develop such a Theory of Change and guide the dissemination and diffusion of teaching enhancements. The stimulating role NOKUT staff has played towards SFUs, suggests that staff members may have used such Theories of Change implicitly, but we did not found further evidence for this.

7.3 Lessons learned for future management of the SFU initiative

Managing initiatives like SFU is always a balancing act. From experiences abroad, as well as from the results of this study, we conclude that the programme management should continue to be more than selecting the initiatives, administration of the overall budget and monitoring progress from a distance. In order to realise more impact beyond the SFU networks and communities, it is pivotal to realise an infrastructure that reaches out more broadly to teaching staff so that they can learn about the SFU results, and exchange about SFU achievements more frequently.

This being said, one can still think of different modalities for such an infrastructure. Our findings suggest that apart from the website, the SFU magazine and the conferences are especially useful to disseminate findings among Adopters, from which many have a position in the institutional leadership. As the SFU initiative is only one in a wide variety of initiatives for teaching enhancement in Norway, it could be useful to join their dissemination forces. For example, an online portal that serves as a one-stop desk could help to spread knowledge and experiences of innovation in higher education across the country

Building upon the experiences of the current eight SFUs, the programme management can also help to improve dissemination strategies. The midterm-evaluations have already asked for improved strategies, and especially in the second phase of operation, one may expect that SFUs have a clearer idea for dedicated forms of dissemination to realise the full innovation potential of their results. An important tool in this is improved monitoring of impacts. This was lacking in the annual reports and evaluations. There is a growing body of literature on this topic, often based on studies on research impact (e.g. Bastow et al. 2014, Reed 2018). Considering the many similarities in context and discourse about dissemination of education and research we found in the documents and scoping interviews, we expect that approaches for monitoring research impact, may also help SFUs and SFU programme management developing relevant impact measures.

The expert committee evaluating the older SFUs suggested that the SFUs should create a Theory of Change. Considering the aim of the SFU initiative to have impacts at the system level and looking at the impact route through organisations, we may conclude that DIKU should work with a more overarching Theory of Change. Identifying the components of such a Theory of Change goes beyond the findings of this study. Such a Theory of Change could also be helpful in the selection process of new SFUs and monitoring and evaluation of the impact of existing ones. Moreover, it may help future management to deal with the variety of SFUs.

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Annex 1 SFU Dissemination Planning and Engagement with Adopters

Name SFU *[mark appropriate one]* → Aspect ↓	BioCEED, CCSE, CEMPE, Engage	CEFIMA, ExcITEd, MatRIC, ProTed
Document →	SFU Application	Annual report 20xx
Type of SFU's major innovation(s) ***[was: Processes, Practices, Structures or Ideas]***	Didactics / Work form / Curriculum / Structure / Idea / whole-SFU-concept	Didactics / Work form / Curriculum / Structure / Idea / whole-SFU-concept
Assessment of innovation *[assessment]*		
- **Amount of user modification expected**	Low / medium / high	Low / medium / high
- **Degree of change to teaching practices required by instructors to adopt**	Low / medium / high	Low / medium / high
- **Degree of cooperation required to adopt**	Low / medium / high	Low / medium / high
- **Amount of resources required to adopt**	Low / medium / high	Low / medium / high
Knowledge about target audiences		
- **clear definition of target audiences**	Specific target group / Class of HEIs in NO / Class of HEIs internationally	Specific target group / Class of HEIs in NO / Class of HEIs internationally
- **knowledge about demands and needs of target audiences**	Evidence / Participatory / Asserted / None	Evidence / Participatory / Asserted / None
- **understanding of characteristics of target audiences**	Low / medium / high	Low / medium / high
Dissemination main purpose	Awareness / Knowledge / Persuasion	Awareness / Knowledge / Persuasion
Dissemination channels ***[mark all appropriate options; highlight primary one if applicable]***	○ Websites ○ Social Media ○ Publications – (grey literature, articles in journals, books) ○ Conference presentations ○ Workshops	○ Websites ○ Social Media ○ Publications – (grey literature, articles in journals, books) ○ Conference presentations ○ Workshops

	○ Joint development of innovation	○ Joint development of innovation
Intensity of engagement with adopters ***[assess, choose one]***	○ Low: passive/reactive ○ Medium: mixed ○ High: (pro-)active	○ Low: passive/reactive ○ Medium: mixed ○ High: (pro-)active

Annex 2 Scoping interviews outline of interview topics

Introduction

The *aim* of scoping interviews is to get a better feel for SFUs and how they fit into the higher education landscape in Norway. The results of our interviews will be used to design a questionnaire, later on in the study.

The interviews with leaders of the SFUs: the interview will be used to learn about the implementation of the programme and if plans were altered, in addition to the documents we are studying	*Other scoping interviews*: Your observations will not be published directly—anonymity is assured.

Privacy: data about this interview will be deleted after they have been integrated into our study results.

SFU leader interviews: Obviously, results can be traced to the separate SFUs, but we do not plan to quote individual interviews, unless you would like to be quoted. Also, would like to list all interviewees in our report, if you agree.	*Other scoping interviews*: data about this interview will be deleted after they have been integrated into our study results, although we would like to list all interviewees in our report, if you agree.

1. Questions to all stakeholders

1) How do you see the role of SFUs (in general) for quality enhancement in NO higher education?

2. Questions to SFU representatives (NOTE: include previous evaluation results!)

2) innovations developed, examples?

How important is dissemination to them?

Did they disseminate other 'things' besides the education innovation?

3) propagation activities (including dissemination)
    a. done according to the strategy?
    b. dissemination channels used
    c. who were your target groups:
        i. inside own university: own discipline — broad audience
        ii. other NO universities: own discipline — broad audience
        iii. universities abroad: own discipline — broad audience
        iv. Other: …

4) adoption rate (how many and to what extent innovations have been adopted), by whom?

5) adjustments to dissemination plans

6) other [propagation] activities undertaken

7) exchange with potential innovation adopters (also involvement of potential adopters when developing innovations? – intra- and interinstitutional exchange/collaboration?

8) if results have been achieved?

Do SFU follow up who adopts? If yes, how?

From their perspective – how would they rate the adoptability of their innovations? Why are innovations difficult/easy to adopt?

9) management by NOKUT
    a. application process
        i. were award criteria clear in advance?
        ii. Were criteria relevant to what you wanted to achieve with your Unit/colleagues?
        iii. Success rate: too low / just right / too high
            1. What consequences of this success rate?
        iv. Other observations on application process:
    b. Management of the ongoing SFU
        i. To what extent is NOKUT supportive? In what areas? How?
            1. Regulation/frameworks
            2. Expertise
            3. Dissemination
                a. Organising / sponsoring events
                b. SFU magazine
                c. Website
                d. …
        ii. To what extent is NOKUT making the SFU's life hard? In what areas? How?
            1. Regulations
            2. Reporting demands
            3. Interference?
            4. Dissemination?

        iii. Is funding coming forward as promised?

        iv. Is funding sufficient for your plans?
            1. How were priorities set and/or how were decisions made to not do certain plans?

            2. Was NOKUT involved in making such decisions?
    c. Lessons for future management of SFUs: …

Include more strongly: How do SFU perceive NOKUT's role in facilitating collaboration between SFU and institutions not hosting SFU?

Being awarded SFU status appears to be very prestigious – What do you think non-SFU institutions are mostly interested in: achieving the status, enhancing and innovating their education or something different? (Mimetic effects of the initiative) - Did others contact ProTed?

Is every university now expected to have an SFU – Status?

3. Questions to 'receiving' University representatives (LiNK/UiO)

10) How do you see the role of the SFUs in your area (name: …) for quality enhancement in your university/ faculty/ department?

11) Why did UiO start Link? Models? Are you a model to others?

4. Questions to national stakeholders (Ministry, Universities Norway)

12) Do you think the idea of SFU was a good initiative? For what purpose(s)? (e.g. balance against focus on research; innovation of education locally/nationally, …)

13) Do you think the current SFUs are doing a good job of achieving those purposes you mentioned?
    a. Why/Why not?

    b. Are there differences among the SFUs (ProTed as pilot was different, I have heard say…)?

14) What are strong and weak points of NOKUT in managing the SFUs?
    a. Strong

    b. Weak

15) Will having another institute manage the SFUs make a difference? In what respects? Positively or negatively?

Annex 3 List of interviewees in scoping study

SFUs	BioCeed CEFIMA CEMPE ExclTed ProTed Student representative
Other higher education institutions/units	NTNU TRANSARK University in Oslo, Faculty of Humanities
SFU experts	Paul Ashwin Duncan Lawson
System level – decision makers and observers	Ministry of Education & Research UHR, Universities Norway NOKUT – Communication, Director, Controller, Project staff Bjørn Stensaker, University in Oslo

Annex 4 Online questionnaire potential adopters

SFU Evaluation

Start of Block: Introduction

Intro Dear respondent,

You are being invited to participate in an evaluation study on the Norwegian Centres for Excellence in Education, the so-called SFU. This study is being done by the Centre for Higher Education Policy Studies (CHEPS) from the Faculty of Behavioural, Management and Social Sciences at the University of Twente. The study is commissioned by NOKUT, the Norwegian Agency for Quality Assurance in Education (contract 18/04676-10).

The purpose of this evaluation study is to investigate if the SFU have so far stimulated enhancement in teaching and learning in the Norwegian higher education sector. The survey will take you approximately 20 minutes to complete. The data will be used to learn how well known the SFU are and if they have stimulated educational enhancement beyond their host institutions.

For the purpose of this study CHEPS has established a data base with contact details of employees at Norwegian higher education institutions. The database contains only information of persons whose contact details are freely accessible on the websites of their institutions. From this database your name hase been selected randomly. At the end of the study this data base will be deleted.

Your participation in this study is entirely voluntary and you can withdraw at any time. You are free to omit any question.

Please be assured that all information that you provide will be treated confidentially by CHEPS. No data will be provided by CHEPS to NOKUT or any further third party. The results of the survey will be published in aggregate form, to preserve the anonymity of respondents.

If you have any queries about the survey or the study, please contact Andrea Kottmann (CHEPS), at a.kottmann@utwente.nl.

We appreciate the time taken to provide this response and thank you for your contribution to this important study.

End of Block: Introduction

Start of Block: Background questions

Intro 2 In the following we would like to collect some information on your role in your institution, and on your background.

Q1 What is your main role within your institution?
Please select the role that best fits your current position.

- ○ Institutional leadership (Rector, Deans, Vice Deans, etc.) (5)
- ○ Professor (4)
- ○ Academic staff with teaching duties below professorial rank (2)
- ○ Academic staff without teaching duties below professorial rank (3)
- ○ Educational advisor (1)

Q2.1 Please indicate your gender.

- ○ Male (1)
- ○ Female (2)
- ○ Other (5)
- ○ Don't want to indicate (4)

Q2.2 What is your highest earned degree?

- ○ Bachelor's degree or similar (5)
- ○ Master's degree or similar (6)
- ○ Doctoral degree (7)
- ○ No higher education degree (9)
- ○ Don't want to indicate (10)

Q2.3 What is the discipline of your highest earned degree?
Please select from the list below the discipline that best matches the discipline.

- ○ Mathematics and computer sciences (42)
- ○ Physical sciences (62)
- ○ Chemical sciences (63)
- ○ Earth and related environmental sciences (64)
- ○ Biological sciences (65)
- ○ Civil engineering (66)
- ○ Electrical engineering, electronics (67)
- ○ Other engineering sciences (68)
- ○ Basic medicine (69)
- ○ Clinical medicine (70)
- ○ Health sciences (71)
- ○ Agriculture, forestry, fisheries and allied sciences (72)
- ○ Veterinary medicine (73)
- ○ Psychology (74)
- ○ Economics (75)
- ○ Educational sciences (76)
- ○ Other social sciences (77)
- ○ History (78)
- ○ Languages and literature (79)

○ Other humanities (80)

‘

Q2.4 What level best describes the unit/department/group you are working for?

- ○ Central level (1)
- ○ Faculty level (2)
- ○ Department level (3)

Q57 Please indicate the disciplinary area of your faculty or department.

- ○ Natural sciences (1)
- ○ Engineering and technology (4)
- ○ Medical and Health sciences (5)
- ○ Agricultural sciences (6)
- ○ Social sciences (7)
- ○ Humanities (8)

Q2.5 What is your age?

- ○ Under 25 (1)
- ○ 25-34 (2)
- ○ 35-44 (3)
- ○ 45-54 (4)
- ○ 55 or older (5)
- ○ Don't want to indicate (6)

Q2.6 Since when have you been working in your current position?
Please indicate the year you started to work in your current position.

_____

End of Block: Background questions

Start of Block: Engagement in enhancing educational quality

Intro 3
In the following you will be provided with questions on your view of educational enhancement and your actual engagement in this area. With educational enhancement we refer to any activity that aims to improve the quality of teaching and learning in your institution.

Q3.1 Please rate the general importance of educational enhancement for the different levels listed in the table below.

	Not at all important (1)	Slightly important (2)	Moderately important (3)	Important (4)	Very important (5)	Don't know (7)
In my institution (5)	○	○	○	○	○	○
In my unit (i.e. in my department or group) (6)	○	○	○	○	○	○

Q3.2B What is the importance of educational enhancement in your teaching activities?

- ○ Not at all important (1)
- ○ Slightly important (4)
- ○ Moderately important (5)
- ○ Important (6)
- ○ Very important (7)
- ○ Don't know (8)

Q3.3C How do you rate the importance of educational enhancement in the strategic plans of the different units listed below?

	Not at all important (1)	Sligtly important (2)	Moderatly important (3)	Important (4)	Very important (5)	Don't know (6)
In the institution's strategy and plans (1)	○	○	○	○	○	○
In your faculty's strategy and plans (2)	○	○	○	○	○	○
In your department's strategy and plans (3)	○	○	○	○	○	○

Q3.4AB To your knowledge, is educational enhancement addressed in the strategic plans of your unit?

- ○ Yes (1)
- ○ No (2)
- ○ Don't know (3)

Q4A To what extent is your work related to educational enhancement?

- ○ Not at all (1)
- ○ To some extent (2)
- ○ To a moderate extent (6)
- ○ To a large extent (4)
- ○ To the fullest extent (5)
- ○ Don't know (7)

Q4B Have you already engaged in enhancing your teaching activities? E.g. through implementing educational innovations or attending course to improve your didactical knowledge?

- ○ No (1)
- ○ Not yet, but I am planning do so in the near future (2)
- ○ Yes, I have already done so (3)

Q4C Has your institution already been actively involved in enhancing the quality of its education through supporting the implementation of educational innovations?

- ○ No (1)
- ○ No, but there are plans to do so in the near future (2)
- ○ Yes, the institution has already engaged in this area (4)

Q7AC To what extent have the following reasons stimulated educational enhancement activities at your institution?

	Not applicable (1)	Not at all (2)	To some extent (3)	To a moderate extent (4)	To a high extent (5)	To a very high extent (6)	Don't know (7)
There were demands from students for enhancing the educational quality (1)	○	○	○	○	○	○	○
There were demands from teachers to further enhance the educational quality (4)	○	○	○	○	○	○	○
There were demands from stakeholders (e.g. employers or ministry) to further enhance the educational quality (5)	○	○	○	○	○	○	○
The institution stimulated this change through implementing a reward system for good teaching (6)	○	○	○	○	○	○	○
The institution provided incentives such as time and money to academic staff to support their enhancement activities (7)	○	○	○	○	○	○	○
The institution defined teaching skills as important criteria for career progression of academics (8)	○	○	○	○	○	○	○
The institution engaged in increasing the awareness of the importance of high quality teaching among academic staff and students (9)	○	○	○	○	○	○	○
National funding initiatives encouraged institutions to focus their attention to enhancing their educational quality (10)	○	○	○	○	○	○	○

Other reasons, please add: (11)	○	○	○	○	○	○	○

Q7B To what extent have the following reasons stimulated your educational enhancement activities?

	Not at all (1)	To some extent (2)	To a moderate extent (3)	To a high extent (4)	To a very high extent (5)	Not applicable (6)	Don't know (7)
I had a personal interest in enhancing my teaching skills (1)	○	○	○	○	○	○	○
I was disappointed about students' learning outcomes (2)	○	○	○	○	○	○	○
I wanted to try out a new educational approach (3)	○	○	○	○	○	○	○
A colleague recommended this approach (4)	○	○	○	○	○	○	○
Improving my teaching skills helped me to advance in my career. (5)	○	○	○	○	○	○	○
Students asked for more innovative forms of teaching (6)	○	○	○	○	○	○	○
My institution provided financial support for engaging in educational enhancement (7)	○	○	○	○	○	○	○
My institution provided me with time for engaging in educational enhancement (8)	○	○	○	○	○	○	○

Other reasons, please add: (9)	○	○	○	○	○	○	○

Q8 To what extent has the value given to education changed in your institution in the last five years?

- ○ Strongly decreased (1)
- ○ Decreased (2)
- ○ Not changed (3)
- ○ Increased (4)
- ○ Strongly increased (5)
- ○ Don't know (6)

End of Block: Engagement in enhancing educational quality

Start of Block: SFU Scheme

Intro4

This section addresses the Norwegian Centers for Excellence in Education, the SFU Initiative. The questions below address your awareness of the SFU initiatives and to what extent it has contributed to your educational enhancement activities.

Q9.1 Do you know the SFU initiative (i.e. Norwegian Centers for Excellence in Education)?

- ○ Yes (1)
- ○ No (2)

Q9.2 How did you learn about the SFU initiative? (dissemination channels)

- ☐ Through the NOKUT Website (1)
- ☐ Through the SFU Magizine (4)
- ☐ Through the calls for funding for the SFU initiative (5)
- ☐ At a conference organized by NOKUT (6)
- ☐ At a different conference (2)
- ☐ From a journal article (3)
- ☐ From a colleague (11)
- ☐ In an internet search (8)
- ☐ Other communication, please write down here: (9)

_____

- ☐ I don't remember (7)
- ☐ Don't know (12)

Q9.3 How frequently have you heard about the following SFU?

	Never (1)	Rarely (2)	Occasionally (3)	Frequently (4)	Very frequently (5)
bioCEED – Centre for Excellence in Biology Education (1)	○	○	○	○	○
CCSE – Center for Computing in Science Education (4)	○	○	○	○	○
CEFIMA – Centre of Excellence in Film and Interactive Media Arts (5)	○	○	○	○	○
CEMPE – Centre of Excellence in Music Performance Education (6)	○	○	○	○	○
Engage – Centre for Engaged Education through Entrepreneurship (7)	○	○	○	○	○
ExcITEd – Centre for Excellent IT Education (8)	○	○	○	○	○
MatRIC – Centre for Research, Innovation and Coordination of Mathematics Teaching (9)	○	○	○	○	○
ProTed – Centre for Professional Learning in Teacher Education (10)	○	○	○	○	○

Q9.4 How relevant are the SFU listed below for you?

	Not at all relevant (1)	Slightly relevant (2)	Moderately relevant (3)	Relevant (4)	Very relevant (5)	Not applicable (7)
bioCEED – Centre for Excellence in Biology Education (1)	○	○	○	○	○	○
CCSE – Center for Computing in Science Education (4)	○	○	○	○	○	○
CEFIMA – Centre of Excellence in Film and Interactive Media Arts (5)	○	○	○	○	○	○
CEMPE – Centre of Excellence in Music Performance Education (6)	○	○	○	○	○	○
Engage – Centre for Engaged Education through Entrepreneurship (7)	○	○	○	○	○	○
ExcITEd – Centre for Excellent IT Education (8)	○	○	○	○	○	○
MatRIC – Centre for Research, Innovation and Coordination of Mathematics Teaching (9)	○	○	○	○	○	○
ProTed – Centre for Professional Learning in Teacher Education (10)	○	○	○	○	○	○

Q9.5C Has your institution/faculty/department already engaged in an SFU application?

- ○ Yes, because: (please indicate major reasons for engaging in the SFU initiative below) (1) _____
- ○ No, because: (please indicate major reasons for not engaging in the SFU initiative below) (2) _____
- ○ Don't know (3)

Q10.1 Do you know of any other current Norwegian initiatives to enhance the quality of education in higher education institutions? These can involve national as well as institutional initiatives.

- ○ Yes (1)
- ○ No (2)

Q10.2 Which initiatives are these?

- ○ Initiative 1 (1) _____
- ○ Initiative 2 (2) _____
- ○ Initiative 3 (3) _____
- ○ Initiative 4 (4) _____

Q10.3 How did you learn about these initiatives?

- ○ Initiative 1 (1) _____
- ○ Initiative 2 (2) _____
- ○ Initiative 3 (3) _____
- ○ Initiative 4 (4) _____

Q10.4 Please compare the SFU initiatives to the initiatives you mentioned with regard to their relevance for your work. As compared to the other initiatives, the SFU initiatives are:

	Far less relevant (1)	Less relevant (3)	Equally relevant (2)	More relevant (4)	Far more relevant (5)	Don't know (6)
Initiative 1 (x1)	○	○	○	○	○	○
Initiative 2 (x2)	○	○	○	○	○	○
Initiative 3 (x3)	○	○	○	○	○	○
Initiative 4 (x4)	○	○	○	○	○	○

Q11.1
Did you come across any information, knowledge or descriptions of teaching enhancement practices that were connected to a SFU?

- ○ Yes, namely: (please specify) (1) _____
- ○ No (2)

Q11.2 How did you learn about these SFU achievements?

- ☐ From the internet (1)
- ☐ In a journal article (4)
- ☐ At a conference (5)
- ☐ Through a colleague (6)
- ☐ Other communication, please write down here: (2) _____
- ☐ I don't remember (3)
- ☐ Don't know (7)

Q49 Have you changed your practices or developed teaching and learning activities based on information or results from the SFUs or the SFU initiative?

- ○ Yes, I did. (1)
- ○ No, but I am planning to do so in the near future. (2)
- ○ No. (3)
- ○ Don't know (4)

Q13.3B How frequently do you apply information, knowledge or practices that are connected to a SFU or the SFU initiative to the enhancement activities listed in the table below?

	Never (1)	Rarely (2)	Occasionally (3)	Frequently (4)	Very frequently (5)	Don't know (6)
To learn about student demands (1)	○	○	○	○	○	○
To achieve up-to-date didactical knowledge (2)	○	○	○	○	○	○
To inspire my own teaching (4)	○	○	○	○	○	○
To adopt educational innovations (5)	○	○	○	○	○	○
Other enhancement activity, please specify: (3)	○	○	○	○	○	○

Q13.2AC How frequently do you apply information, knowledge or practices that are connected to a SFU or the SFU initiative to the enhancement activities listed in the table below?

	Never (1)	Rarely (2)	Occasionally (3)	Frequently (4)	Very frequently (5)	Don't know (6)
To learn about student demands (1)	○	○	○	○	○	○
To achieve up-to-date didactical knowledge (4)	○	○	○	○	○	○
To inspire the creation of education innovations at my institution (2)	○	○	○	○	○	○
To adopt and implement educational innovations (5)	○	○	○	○	○	○
To check our competitiveness in education (6)	○	○	○	○	○	○
To enrich the didactical training for academic staff (7)	○	○	○	○	○	○
Other enhancement activity, please specify: (8)	○	○	○	○	○	○

Q12.1 Do you know of any other information, knowledge or practice to enhance the quality of education in higher education institutions from Norway that was not connected to a SFU or the SFU initiative?

○ Yes, namely: (please indicate such an educational enhancement) (1)
_____

○ No (2)

Q12.4 Please compare the SFU educational enhancements to the non-SFU educational enhancements you mentioned with regard to their relevance for your work or for your institution.

As compared to the other enhancements, the SFU enhancements are:

- ○ Far less relevant (4)
- ○ Less relevant (5)
- ○ Equally relevant (6)
- ○ More relevant (7)
- ○ Much more relevant (8)
- ○ Don't know (9)

Q14.1A Have the SFU initiative or any of the SFUs inspired change at your institution?

- ○ Yes (1)
- ○ No (2)
- ○ I don't know. (4)

Q14.1B Have you changed your practices, teaching and learning methods based on the SFU initiative or inspiration from the SFU?

- ○ Yes (1)
- ○ No (2)

Q14.1C Do you encourage the adoption of SFU enhancements or other SFU output at your institution?

- ○ Yes (1)
- ○ No (2)

Q14.2AC Please rate to what extent SFU enhancements or other SFU output...

	Not at all (1)	To a slight extent (2)	To a moderate extent (3)	To a high extent (4)	To a very high extent (5)	To a too high extent (6)	Don't know (7)
...need to be modified in order to be usable in your institution? (1)	○	○	○	○	○	○	○
...require a change of the teaching practices to be adopted? (4)	○	○	○	○	○	○	○
... require that you closely collaborate with the developers from the SFU in which it was created? (2)	○	○	○	○	○	○	○

Q14.2B Please rate to what extent SFU enhancements or other SFU output...

	Not at all (1)	To a slight extent (2)	To a moderate extent (3)	To a high extent (4)	To a very high extent (5)	To a too high extent (7)	Don't know (6)
...need to be modified in order to use it in your teaching (1)	○	○	○	○	○	○	○
...require you to change your teaching practice in order to adopt it (2)	○	○	○	○	○	○	○
... require you to closely collaborate with the creating SFU when adopting it to your teaching (3)	○	○	○	○	○	○	○

Q15 How do you rate the aspects below for the adoption of SFU enhancements or other SFU output in your institution or in your work?

	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)	Don't know (6)
At my institution the institutional leadership supports change in teaching and learning based on information, knowledge and results form the SFUs (1)	○	○	○	○	○	○
At my institution the institutional leadership points to the SFU as good practice for educational enhancement (4)	○	○	○	○	○	○
The adoption of SFU enhancements is time-consuming (5)	○	○	○	○	○	○
The adoption of SFU enhancements requires additional funding (2)	○	○	○	○	○	○
Staff at my institution is well prepared to adopt SFU enhancements (6)	○	○	○	○	○	○
Students at my institution easily accept changes in the teaching practice due to adopting SFU enhancements (7)	○	○	○	○	○	○
SFU enhancements are easy to apply to the specific requirements of my institution (8)	○	○	○	○	○	○
My institution has the infrastructure that is needed to adopt SFU enhancements (9)	○	○	○	○	○	○
My institution has established an open quality culture that supports engagement with SFU enhancements (3)	○	○	○	○	○	○

Q54

How do you rate the aspects below for the adoption of any educational enhancements in your institution or in your work?

	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)	Don't know (6)
At my institution the institutional leadership supports the adoption of educational enhancement activities that were developed elsewhere (1)	○	○	○	○	○	○
At my institution the institutional leadership points to selected educational enhancement activities as good practice (4)	○	○	○	○	○	○
The adoption of educational enhancements is time-consuming (5)	○	○	○	○	○	○
The adoption of educational enhancements requires additional funding (2)	○	○	○	○	○	○
Staff at my institution are well prepared to adopt educational enhancements (6)	○	○	○	○	○	○
Students at my institution easily accept changes in teaching practice that are due to adopting educational enhancements (7)	○	○	○	○	○	○
Most educational enhancements are easy to apply to the specific requirements of my institution (8)	○	○	○	○	○	○
My institution has the infrastructure that is needed to adopt educational enhancements (9)	○	○	○	○	○	○
My institution has established an open quality culture that supports the engagement with educational enhancements (3)	○	○	○	○	○	○

Q55 Are there any further facilitators or hindrances to implementing educational enhancements you would like to mention?

- ○ Facilitator (1) _____
- ○ Facilitator (2) _____
- ○ Facilitator (3) _____
- ○ Hindrance (4) _____
- ○ Hindrance (5) _____
- ○ Hindrance (6) _____

End of Block: SFU Scheme

Start of Block: Nokut's role and final question

Q17 How often do you use the following resources provided by NOKUT and how useful is the provided information? / How useful are the following resources for your day to day work?

	Frequency						Usefulness					
	Never (1)	Sometimes (2)	Frequently (3)	Often (4)	Always (5)	Don't know the resource (6)	Not useful at all (1)	Not useful (2)	Somewhat useful (3)	Useful (4)	Very useful (5)	Don't know the resource (6)

Nokut website (1)	○	○	○	○	○	○	○	○	○	○	○	○
SFU Magazine (4)	○	○	○	○	○	○	○	○	○	○	○	○
Podcasts (5)	○	○	○	○	○	○	○	○	○	○	○	○
Reports (6)	○	○	○	○	○	○	○	○	○	○	○	○
Conference (7)	○	○	○	○	○	○	○	○	○	○	○	○
Other NOKUT material, please specify: (9)	○	○	○	○	○	○	○	○	○	○	○	○

Q53 Final question:
Please feel free to leave critical remarks or suggestions in relation to the SFU initiative or this study.

_____

End of Block: Nokut's role and final question

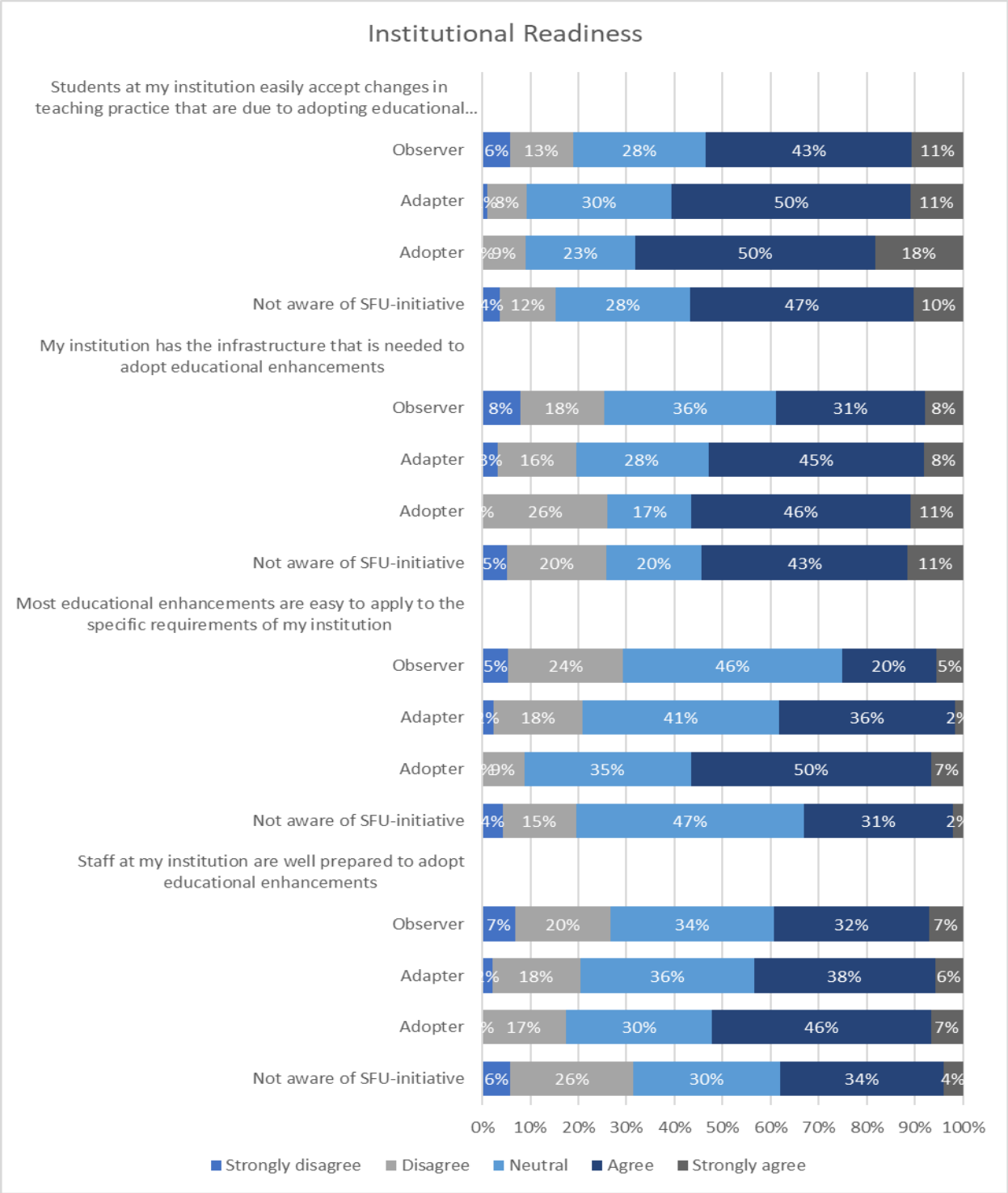
Start of Block: Thank you!

Thankyou Thank you very much for taking our survey. Your response is very important to us.

End of Block: Thank you!

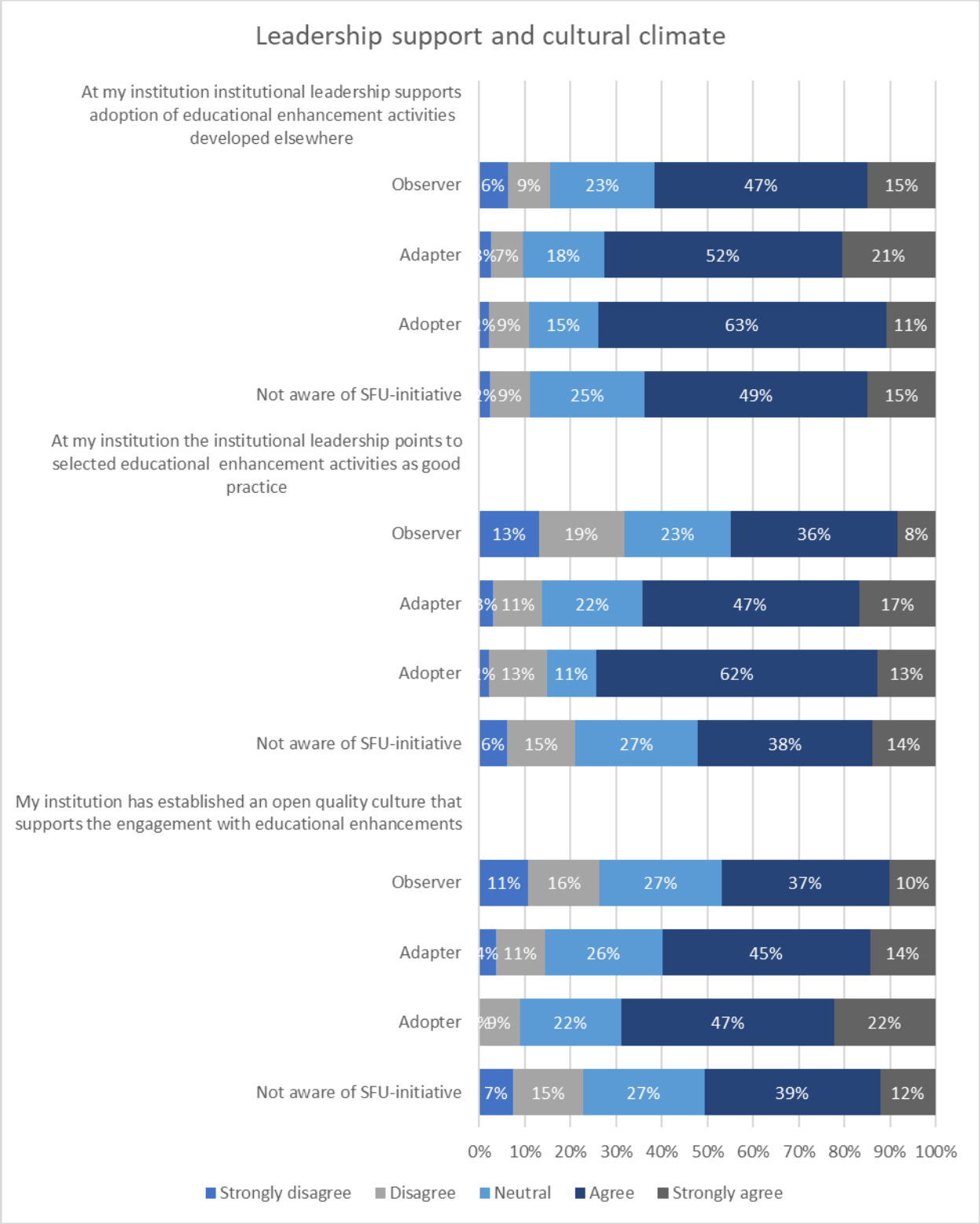
Annex 5 Frequency statistics and other survey results

Figure 18: Evaluation of Institutional Readiness for the adoption of educational innovations, %, Question Q54: "How do you rate the aspects below for the adoption of any educational enhancement in your institution or in your work?, Values -2 'Strongly disagree', -1 'Disagree', 0 'Neutral', 1 'Agree', 2 'Strongly agree'



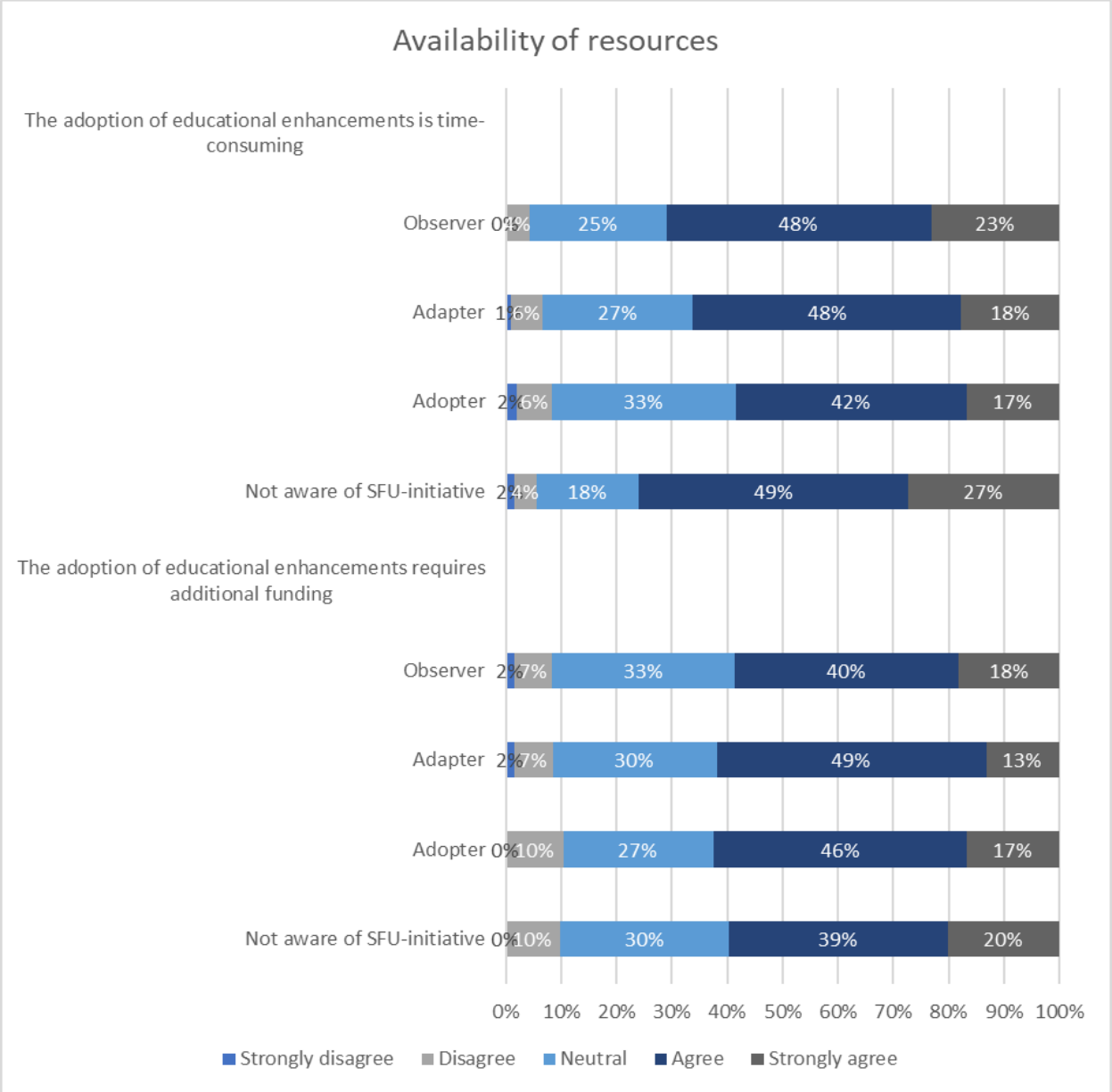
Source: CHEPS SFU Survey 2019, Author's calculations, sig. 0.000

Figure 19: Evaluation of Leadership support and cultural climate for the adoption of educational innovations, %, Question Q54: "How do you rate the aspects below for the adoption of any educational enhancement in your institution or in your work?, Values -2 'Strongly disagree', -1 'Disagree', 0 'Neutral', 1 'Agree', 2 'Strongly agree'



Source: CHEPS SFU Survey 2019, Author's calculations, sig. 0.000

Figure 20: Evaluation of Availabilty of resources for the adoption of educational innovations, %, Question Q54: "How do you rate the aspects below for the adoption of any educational enhancement in your institution or in your work?, Values -2 'Strongly disagree', -1 'Disagree', 0 'Neutral', 1 'Agree', 2 'Strongly agree'



Source: CHEPS SFU Survey 2019, Author's calculations, no significant differences between SFU-User types

Box 1: Educational enhancement initiatives mentioned by respondent, Question Q10.2 "Which initiatives are these?, all mentions.

- (Mathematics) education conferences
- (not chosen as a 2019 finalist) REDE - Resilience and Ethics in Dance Education Oslo National Academy of The Arts (KHiO)
- «Merittert undervisar»
- A local level initative
- A network at department level for women academics on tenure track
- A new focus through Stortingsmelding 16, 2017
- A number of local initiatives
- accredited teacher at my institution
- ACT
- Akademisk skrivesenter UiB/UBB
- All DIKU programmes
- all staff need to take a course in pedagogy
- Appointing merited educators
- Aquaculture
- At UiO we have LINK which also funds and helps in enhancing education
- Atee
- Awards for good teaching
- become a merited teacher (higher salaries and status)
- Becoming a "Teaching Professional"
- Bestemmelser om studieplan revisjon
- BI Norwegian Business School's Learning Lab initiatives
- BioCeed
- But I can not name any external strategic programs if that was the question
- C21 enhance
- Call for fundings for international cooperation
- Call for fundings to enhance research-based education
- Calls from Norwegian Research Council
- Canvas has possibilities
- career plans for scientific staff - new national position structure
- CCse
- CEED
- CENE
- Center for assessment in medical education (CAME)
- Center for learning environment
- Center for Science & Engineering Education Development
- Center of Assessment in Medical Education - CAME
- Centers of Excellence (such as FAIR at NHH)
- Centre for Multilingualism in Society across a Lifespan
- change of medical education from semster to muduls
- Chemistry conceptual Inventories-Scandinavian collaboration
- Colleague peer evaluation at the faculty
- Compulsory course for university teachers
- Compulsory courses in pedagogy
- Compulsory teaching courses for tenure staff
- Constant focus on teaching methods, institutionally and beyond
- Course in practical pedagogics and digital pedagogics for university college level teachers (such as myself)
- course in university and høgskole pedagogy for empoyies
- Courses at Faculty level on "fagfellevurdering"
- Creditation for good teaching
- Curriculum reform
- Daily work in my department on increasing teaching quality
- Dannelsesemnene (buildung courses) at the University of Bergen

- DEKOM
- Demand for meriting systems through teaching
- Demans for courses in basic university pedagogy
- Department level, strategic funding to enhance education and teaching methods
- Department: Change in study plans at the BA and MA level. Call for differentiation in teaching and examination methods
- departmental initiatives at the bachelor level
- Desentralisert Kompetanseutvikling
- Developing projects at the faculty
- Development IT based education
- Development of eLearning for skills improvement
- Didactics for those teaching science to teacher students
- Different edtech iniatived as regional founding
- Different prizes
- Different projects that are either improving teacher/teacher training skills or teacher training students
- DigiGLU
- DiGiLU
- DigiLU at Østfold University College and parallel institutions
- Digitalisering for læring i høyere utdanning
- Digitalisering i lærerutdanningene
- Digitalization
- Diku
- Diku
- DIKU
- DIKU
- Diku
- DIKU
- DIKU
- DIKU
- DIKU
- DIKU
- Diku
- Diku
- diku
- DIKU
- DIKU
- Diku
- DIKU
- DIKU - senter for internasjonalisering og kvalitetsutvikling av utdanning
- DIKU (previously Norgesuniversitetet) funding of educational digitalisation projects
- DIKU calls
- DIKU calls for project funding related to educational and teaching innovation
- DIKU calls for student-centered learning
- DIKU calls for teaching development
- DIKU Digitization for learning in higher ed
- Diku Erasmus and EU founding
- DIKU- founding
- DIKU funding
- Diku funding schemes
- DIKU grants
- DIKU has several
- DIKU initiatives
- DiKu projects
- Diku projects
- DIKU proposal on Student Active Learning

- DIKU/Digitalisering
- DIKU/Intern Abroad
- DIKU/Intpart
- DIKUs Active Learning funding scheme
- Dikus development tools
- DIKUs funding of active learning initiatives
- DIKU's funding of student active teaching methods
- DIKU's programme for student active learning
- Dikus teaching award
- Diverse tiltak i flukt med foregående, pågår p.t.
- Do not want to name. Know 5-10. Mainly university-sponsored on a scale EUR 10 000- 500 000.
- Documentation of pedagogic competence needed for accreditation to professor position: Forskrift om endring i forskrift om ansettelse og opprykk i undervisnings- og forskerstillinger https://lovdata.no/dokument/SF/forskrift/2018-09-12-1322
- Education in University Pedagogics for University employees
- Education management software of several types
- Education merit system
- Education specialist (ministry initiative)
- Educational measurement
- Educational merit system at NTNU
- Educational merit system at UIT
- Educational merit system at VID
- Educational Research Group
- Endring i forskrift ved ansettelser med krav om pedagogisk utviklingsarbeid ved opprykk og ansettelser
- Enhet for akademisk språkpraksis, OsloMet
- Erasmus
- Erasmus +
- Erasmus funding for educational quality
- Erasmus Mundus initiatives
- Erasmus+
- Erasmus+'s funding for teacher network
- EU calls
- Excellent Teaching Practioner program at UiB
- Excellent teaching practitioner
- Excellent Teaching Practitioners (some institutions)
- exchnage programs
- ExCited
- Expansion of mandatory course in university level pedagogical skills
- extended educational training in Norwegian universities
- faculty focus on senior staff supervising students
- Faculty level initiatives
- Faculty: Change to Canvas, courses available on new pedagogical methods
- feedback from students
- FINNUT
- Finnut
- FINNUT - NFR
- FINNUT Norwegian Research Council
- Fonding from Norgesunivsersitet /diku for use of tech i teaching
- Forskningsrådet
- førstelektorprogrammet
- FOU in practice
- fremragende/merittert underviser
- Fremtidens IKT utdanning ved NTNU
- From DIKU
- from the department

- funding from NOKUT for quality in education
- funding from the Norwegian Research Council for innovation in education
- Fyrtårnsprosjekter
- Governmental white paper
- Government's long-term plan for research and higher education
- Grants for active learning (don't remember the details, can check easily)
- Health Faculty, UiT
- HINNS Såkornmidler Our own program to promote good education quality through continuous development of pedagogical practice and innovation
- http://www.vid.no/nyheter/digitalisering-for-laering-i-hoyere-utdanning/
- https://diku.no/programmer/program-for-studentaktiv-laering
- https://www.regjeringen.no/no/tema/utdanning/hoyere-utdanning/innsikt/kvalitet-i-hoyere-utdanning/id2008162/ White paper. But no financial support to make changes.
- I do no tknow if they have names, and if they had I would be terrible to remember those names.
- iEarth
- iEarth
- IKT i praksis
- impart
- increase the competences of the teachers
- Increased focus on specific subjects
- information abut knew teaching strategies, new type of exams for instance courses, seminars, devices used Kahout, "mini delphi processes etc"
- Ingeniørstigen
- Ingeniørstigen ved IES, NTNU
- Initiative by DIKU at national level
- Initiative from vice rector for teaching at University of Agder
- Initiative inside the institution (university)
- Initiatives at my own faculty (1 MNOK per. year to different projects)
- Initiatives from the Faculty of Educational sciences, University of Oslo
- Initiatives to establish plans for improving teaching at my institution
- Innovation (UiT research group)
- INPART
- Institional focus on teaching portefolio when hiering new staff (academic)
- Institution grants
- Institutional arrangements for promoting excellence in teaching
- Institutional Education and Learning Labs
- Institutional initiatives at NTNU with mini projects
- Institutional initiatives at UiA with mini projects
- INTERACT
- InterAct at University of Oslo
- InterAct, Science faculty, Univ of Oslo
- InterAct, Univ of Oslo
- Intern abroad
- Internal grants for enhancement of teaching
- Internal initiative at MNfaculty UiO
- Internal institution funding for trying out innovations in teaching
- International cooperation organized by siu.no
- international exchange programs
- International PhD level exchange programmes
- Internationalitaton
- Intiativ at the law faculty
- Intitutional funding of selected innovative learning
- Intitutional initiatives
- Intpart
- INTPART

- INTPART
- Intpart
- INTPART etc for international collaboration
- INTPART program between Harvard and CCBIO
- Journals about (mathematics) education and university teaching
- Kompetanse for Kvalitet
- Kunnskapssenter for utdanning
- KURT at University of Oslo
- Kvalitet i høyere utdanning
- Kvalitetsreformen
- Læringsfestivalen
- Leadership development at the department
- Learnign lab at BI
- Learning Lab, BI Norwegian Business School
- LearningLab, BI Norwegian Business School
- Lecturer carrier plans
- LINK center at the University of Oslo
- LISA - datacollection from classrooms (videodata) UiO
- Local calls at my institution
- Local department initiatives
- Local funding
- Local initiative to provide feedback from learners to teacherstudents at UiO
- Local initiatives
- Local initiatives at institutions
- local initiatives at my own department
- Local initiatives from staff
- Local ones
- Lokale initiativer for å utdanne universitets pedagoger (PedUP på NTNU, usikker om det samme kurs andre plasser)
- Mandatory teacher training at the University.
- Many initiatives at our faculty; funding to investigate and improve teaching and learning, the construction of maker spaces and support to enhance teaching and learning - and more
- Marie Curie
- Master study as teacher eduvcation
- Matematikksentret
- MatNat faculty "studiekvalitetsmidler"
- MatRIC annual conferences
- Matrix
- Merit systems for "Excellent Teaching Practitioners"
- Meritation system at the faculty level
- Merited teacher scheme
- merited teachers
- 'Meritering' of especially good teachers
- Meriterring
- Meriting system at own institution
- Meritorious Teachers (at UiT)
- Meritteringsordningen for forelesere/professorer
- merittert foreleser
- Merittert underviser
- merittert underviser ordninger
- Merritation of educators
- Ministry of Education and Research
- Misc faculty courses, e.g supervision
- MNT-konferansen

- MNT-konferansen and publications/articles
- MNT-konferansen and the UDIT conference
- Moccahuset - same
- MUSEd project (UiT Musikkonservatoriet)
- My Universities own courses
- My University has prices for excellent educators
- NAFOL
- NAFOL
- Nafol
- Nasjonalt senter forkunst og kultur i opplæringen
- National advisory units on different disorders in specialist health care
- National exam in medicine
- National graduate school for teacher education (NAFOL)
- National sentre for recruiting to natrual sciences
- Naturfagsenteret
- New criterias for appointment/promotion as professor
- new curriculum in medicine and changing teaching methods
- New regulations for appointments in academic positions
- NFR
- Nfr
- NFR call to which the dept. applied.
- NHH pedagical training
- NHH såkornsmidler til å utvikle nye undervisningsmetoder
- NHO and LO initiatives for implementing work coordinated higher education (Dual education) in Norway, including the need for pedagogic developments
- NOKUT
- NOKUT
- NOKUT
- NOKUT
- NOKUT
- NOKUT accreditation system
- NOKUT support for GLU institutions
- NOKUT's check of the study programs
- Nokut's yearly prices for good education/learning environments
- Nordforsk
- Nordic cooperation on Centres of Excellence in University Education
- Norgesuniversitetet
- Norgesuniversitetet
- Norgesuniversitetets project founding (now DIKU)
- Norheart (research school financed by the research council)
- Norpart
- NORPART
- Norwegian research council’s call for innovation in higher education.
- NOTED (internationalisataion of teacher education)
- NTNU
- NTNU (personal knowledge)
- NTNU Drive
- NTNU initiatives
- NTNU Teaching Excellence Program
- NTNU Toppundervisning
- NTNU Toppundervisning
- NTNU's initiatives
- NU
- NUDGE
- Nufu

- Obligatory courses in pedagogy for academic staff.
- Obligatory courses in University pedagogy
- økte krav til undervisning ved professoropprykk
- Olav Thon Awards for Excellent Teaching
- Olav Thon teaching prizes and project funding
- On-line teaching and digital teaching MOOCs (international)
- Only initiatives within the framework of my own institution
- Other calls from DIKU
- Other funding schemes like intpart, Thon foundation etc.
- Our own
- Our own initiative for Innovation Pedagogy at UiB
- Pdfk
- PEd courses at UiO
- Pedagogical training course (formerly PedUp)
- Pedagogisk merittering
- Pedagogy requirement for tenured positions
- PEDUP-program NTNU
- PhD supervisor courses (inter-university)
- Plan of giving increased weight on teaching qualification in recruitment processes
- Plans at institution level to recognise excellence in teaching being developed.
- PLUS (Center for pedagogics, learning and teaching)
- PLUS sentre at our faculty
- Possibility for support (time allocation) from the institution if wanting to engage in faculty peer mentoring with my colleagues.
- Postdoctoral supervision education & training programmes
- Prices for excellent new teaching approaches in general
- Prices for good teachers
- Private organisation (Olav Thon)
- Prize for best teacher etc.
- Prizes
- program for fremdragende forskningsformidling
- Program for studentaktiv læring
- Program for studentaktiv læring (Diku)
- Programme in our own department, funded by our university
- Project learning
- Promoting activities towards the "Meritterte underviser" level
- promotion on the basis of merit of teaching
- Promotions to Excellent Teacher Practitioner and associated Pedagogical Academy
- quality in study programs (NOKUT)
- Reading center
- REAL undervisning, Science faculty, Univ of Oslo
- reevaluating the teaching vs publishing ranks
- Requiring teaching staff to take university pedagogy courses
- reseach schools
- Research in chemistry didactics at the department
- research leadership course
- Research on nursing education
- Research projects by colleagues at other universities
- Research Schools for Ph.D. training (NFR forskerskoler)
- Result - Ressurssenter for undervisning, læring og teknologi
- Result (UiT training for staff)
- Result at UiT
- RESULT, UiT The Arctic University of Norway
- RETOS
- Reward systems for teaching at all HE institution by 2019

- Rewards for excellent teaching
- Rom for aktive studenter - konferanse i regi UiT/Oslo MET
- SANGBARSK, NRC-application
- Scope (SFU-application not funded)
- Seminars and courses at dep/institution
- Senter for læring i profesjonsutdanning og praksis VID spesialized university
- Several funding opportunities from DIKU
- Several internal initiatives, e.g. digitalisering av kjemiundervisningen
- several local level initiatives supporting development of new methods
- SFI, Centres for Research-based Innovation
- SFU
- SFU application language learning
- SFU/ NTNU
- SIU initiatives
- SIU/DIKU grants
- SLIPP, Senter for læring i Profesjonell Praksis
- SLU - Centre for Learning and Teaching (UiA)
- Søk og Skriv (UBB)
- Sorry, can't recall any details.
- Special honour for excellent teaching at some institutions
- Standard setting for same exams in different institutions
- Strategi for styrket kvalitet i lærerutdanningen
- Student prize to best teacher
- Studentaktiv læring programmet (Diku)
- Studiebarometer
- Styrking av nærhet til praksisfeltet i undervisningen i trygdemedisin»[Stengthened proximity to practical work in education on social security]
- Suggested revision of professoral levels to acknowledge excellent educators
- Supervisor of future PhD supervisor courses (inter-university)
- Support from institutional level
- sustainable educaton in medicine and health
- Systems for appointing/awarding distinguised teachers at some universities
- Teacher excellence (Pedagogisk merittering)
- Teacher's workshops at NTNU
- Teaching and Learning Lab at my institution
- Teaching Excellence Program at NHH
- Teaching more important in advancement to professor than before
- TePE
- The actions laid out in the White Paper on HE - Quality Culture
- The calls for application at DIKU for funding on IT-in professions and International networks
- The CSE project (UiO)
- The excellent teacher practitioner (UiT/NTNU/Lund)
- The Government is working on a report on mobility in education (exchange programmes etc.)
- The Government is working on a report on relevance of education for practice
- The Lærerutdanning 2025 strategy and its implications
- The natural science faculty at University of Oslo has some events every semester (they are good)
- The new legal frameworks for all Norwegian health & welfare education degrees
- The NOKUT supervisions
- The PLUS center for pedagogic and teaching at the faculty of medicine and health sciences
- The university's yearly price for good education to group/ programs/depts
- The Writing Center NTNU
- The Writing Center UiO
- There is a national department initiative
- There is an initiativ at the department of Electronic system desidn at NTNU
- There is one at the UIS central

- this year's application, University College of Innlandet related to virtual reality in nursing education
- This year's applications, especially University of Stavanger related to simulation and elearning
- together with my collaborators how to do teaching better to fulfill learnings goals and skills
- TropEd
- TVEPS
- UHR-MNT meetings and discussions
- UiO internal funding for educational interventions
- UiO KURT
- UiO strategic initiatives
- UiO-prosjektmidler for digital vurdering
- UiO's founding of a competence centre for STEM teaching - KURT
- UiS funds for improved learning environment
- UiT
- UiT and NTNU giving academic ranking to excellent teachers
- UiT annual applications for accredited teacher status (merittert underviser)
- UiT b-REGN
- UiT demanding documentation of educational proficiency for all new employees
- UiT Result calls
- UiT The Arctic university of Norway in general would like to enhance the quality of education
- UNIPED
- Unit
- Univ of Bergen
- Univ Tromsø
- University kindergartens
- University level initiatives
- University of Bergen (I was a program inspector at this university)
- University of Oslo's funding of digitalization of assessment methods
- University of Stavanger
- University of Tromsø (I have been informed by their quality promotion)
- University Schools
- University teacher training, at this university
- upcoming requirement for professorship
- US, Russia and other partnership programmes such as INTPART
- use of digital devices in teaching
- Utdannings pris
- Utdanningsforskning.no
- Utdanningskvalitetsprisen
- Utdanningspris (Educational prize) at INN
- UTFOR
- Utforsk
- Various funding schemes from DIKU
- Various institutional funding schemes
- Video for quality in chemistry education-NTNU project
- Visiting scholars for teachers
- White paper about quality in HEI (kvalitetsmeldingen)
- White paper on quality in higher education
- You can apply to be an excellent educator and get higher salary
- you need a formal pedagogic education/course to teach in higher education. When getting a permanent teaching position you need to take such a course within a few years to keep your position if you do not have it from before.

Source: CHEPS SFU-Survey 2019, in total 473 mentions from 283 respondents, answers have not been corrected for typos for publication

Box 2: Information, Knowledge or description of teaching practices connected to an SFU mentioned by SFU users.

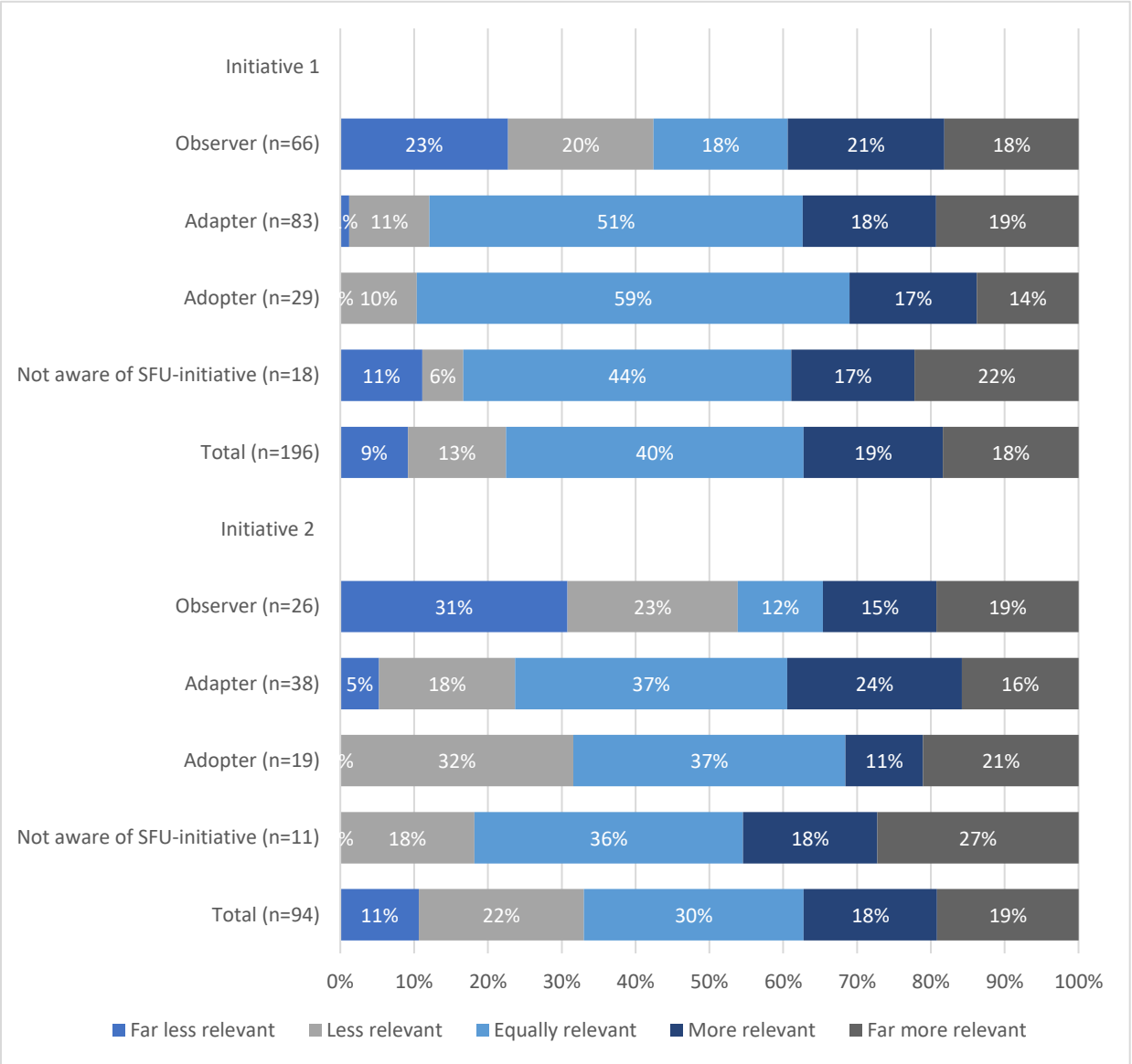
SFU-User Type	Information, Knowledge or description of teaching practices connected to an SFU
Observer	• Conferences by MatRIC and ExcITed • ProTed is an initiative at my university, so it gets mentioned occasionally • bioCEED They had compared different teaching methods in terms of learning outcomes • do not remember • Connected to bioceed and proted • pilot of the 5-year intergated MA for teachers • University onternal communication and website • I've looked at their webpage to see if my science communication could fit in with their funding. It didn't • My institution applied for SFU in nursing education, but did not succed • Through internal reports at INN University and articles at Forskning.no
Adapter	• Too many to name • New educational software, both genereal and more relevant for my field • alternative teaching approaches, IT services, WEB based, etc • Project Based Learning • Course + conferences offered by MatRIC • Bioceed has presented in several seminars I attended • I Lecture from Centre of Excellence in Music Education. • Digital skills and technological comopetens, co-creating in clinical placment and development of professional identity • MaTrix • Through my institutes internal webpage • CEMPE had a seminar day at my institution, which I attended and tried to implement what I had learnt in my teaching. • SOTL course • It is working out such a center on my workingplace, VID. • Children and adolescents • Various MatRIC initiatives • Bioceed • ENGAGE • Seminars • MATRIC-conferences, workshops • In Krona about music education • My department participates in NTNU Excited. • Both simulation (UIS) and virtual reality (UC Innlandet) • Seminar presentations • Field-based teaching in the Earth Sciences • yes. I have hard a fair bit about the EXCITED centre. • Web info activities CEFIMA • Master supervision • At a faculty meeting last April, The people from Excited had a presentation • transveral skills • Partnership models for research & development, digital competence development • BioCeed has presented at several national conferences • Student active larning forms, university school partnerships, App for use of video in teacher education • SCOPE aimed to become a SFU • i read the SFU magazine • ProTed working to change the teacher programs thoroughly, such as with the STIL project • We had participants from SFU's (MatRic, Engage, BioCeed, CCSE og EXcITED) at internal seminars at my faculty

	• https://www.universitetsforlaget.no/nettbutikk/veier-til-fremragende-laererutdanning-uf.html • Don't remember • Teaching material developed by CCSE • Interdisciplinary collaboration with Faculty of Mathematics, Dept of Physics (personal research and teaching initiative as part of a pending research application) • Introduction of a collegium of excellent teachers, observing each other's teaching, student developed apps, students advising students etc • blended learning, flipped lecture, video, digital exam..... • Matric, excited • Student centered teaching, student involvement in developing curricula • the detials offered in the bioceed newsletter • Cempe conferences, Bio Ceed conferences • Research produced at MatRIC • Articles • In internal conferences and meetings • Student activation, flipped classroom • Pedagogical development seminars and papers at teaching festivals • I attended a seminar at NTNU • I do not remember the name • Entrepreneurship and innovation education at NTNU • https://nmh.no/resources/filesnmh/eksternt/kunstnerisk_utviklingsarbeid_og_forskning/cempe/Action-Plan-CEMPE-2019-2023.pdf • I heard about different ProTEd initiatives when I attended a ProTEd conference in JUne 2016 (Bringing T Ed forward) • various digital teaching; flipped classroom; video support • We have visited BioCEED • The NTNU Engage center routinely presents research at international conferences. • presentation at NOKUT meetings • Strenthened cooperation with institutions outside of the University, more professional practice for the students. (ProTed) • Student activity projects and starting program for new students. Master thesis and R&D • Several meetings with BioCeed, e-mails with updates (news) • Yes, but none that were important enough for me to remember • At the UHR-MNT conferences • MatRIC runs a course for educators in mathematics on how to enhance their teaching • Train-the-trailer at Engage • CEFIMA descriptions on how they work to enhance student creativity • Representatives of CCSE have been informing our leadership network about their activities and their work to engage the students more in teaching and research. • Programming integrated in study program • journal article • CCSE and partly BioCEED

Adopter	• Coorporation between MatRIC and BioCeed to enhance math modelling for bio students at UiB • Websites, seminars and collegaues • The first week festival at UiT-ProTED • https://www.mn.uio.no/ccse/index.html • involve the students! • Websider, diskusjoner, erfaringsdeling på konferanser • From Swedwn and Great Britain • Eccol at Østfold University College, seminars in e.g. cooperative learning, multilingual teaching practices • Excited workday for freshman students, Engage seminar on introducing more entrepreneurship in study programs • BioCEED (many), CCSE, MATRIC • In the UiO strategic documents • Digital assessment workshop with MatRIC • Team-based learning, ETP-criteria, books about T&L • Mathematics coding as tool • Engage • filming lectures, using VR facilities in education • NIFU • My institution is applying to become a SFU • In Khrono • Various lectures and meetings and discussions connected to SSCE • MatRIC • Through the SFU Magazine, NOKUT pulications and NOKU conferences • Websites and videoes from ProTed • Programming in Mathematics • International avcreditations, EUA and other International initiatives

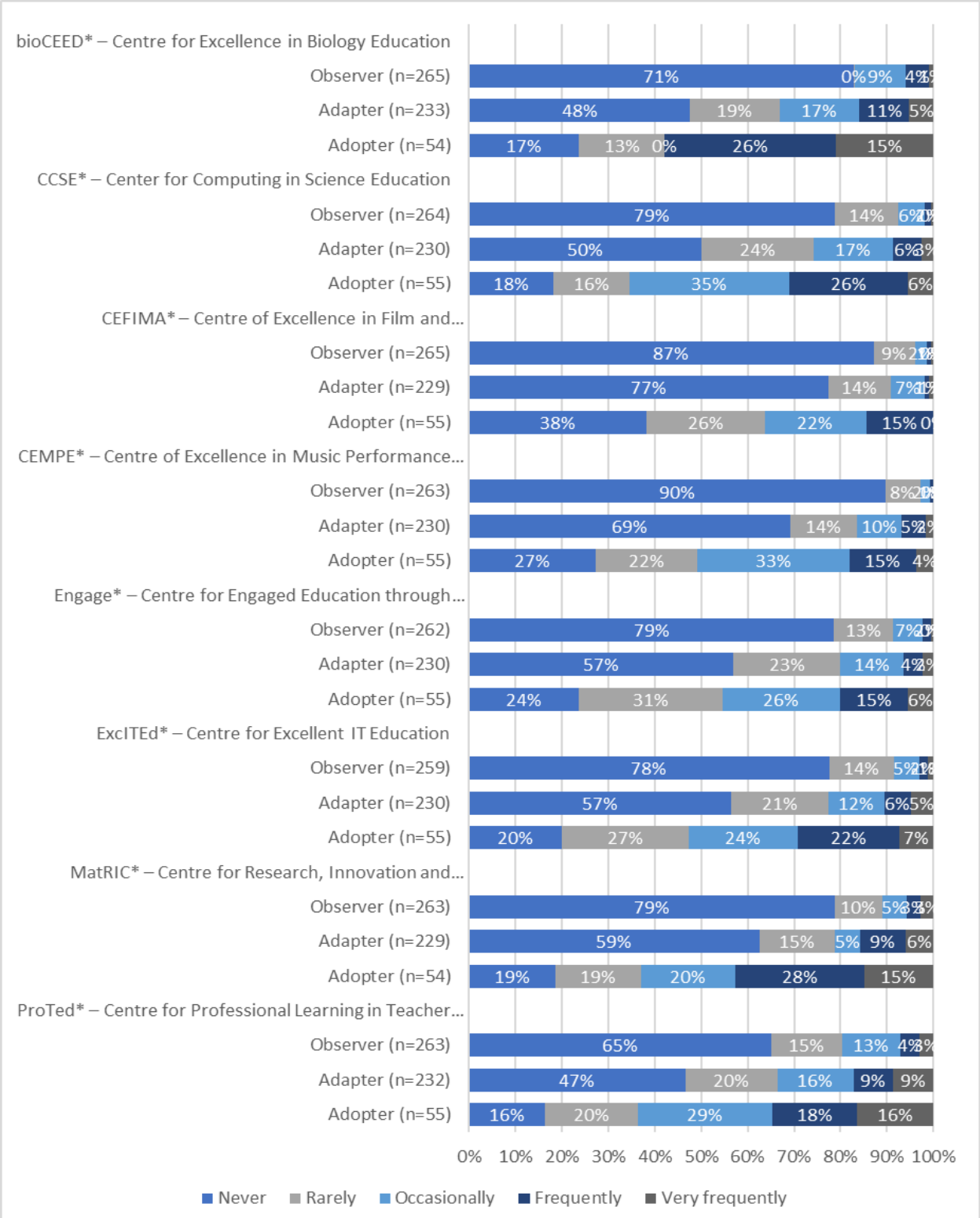
Source: CHEPS SFU-Survey 2019, in total 112 mentions from 112 respondents, answers have not been corrected for typos for publication

Figure 21: Comparing the relevance of the SFU-initiative with other enhancement activities, Question Q10:4: Please compare the SFU initiatives to the initiatives you mentioned with regard to their relevance for your work. Values 1 'far less relevant', 2 'Less relevant', 3 'Equally relevant', 4 'More relevant', 5 ' Much more relevant'.



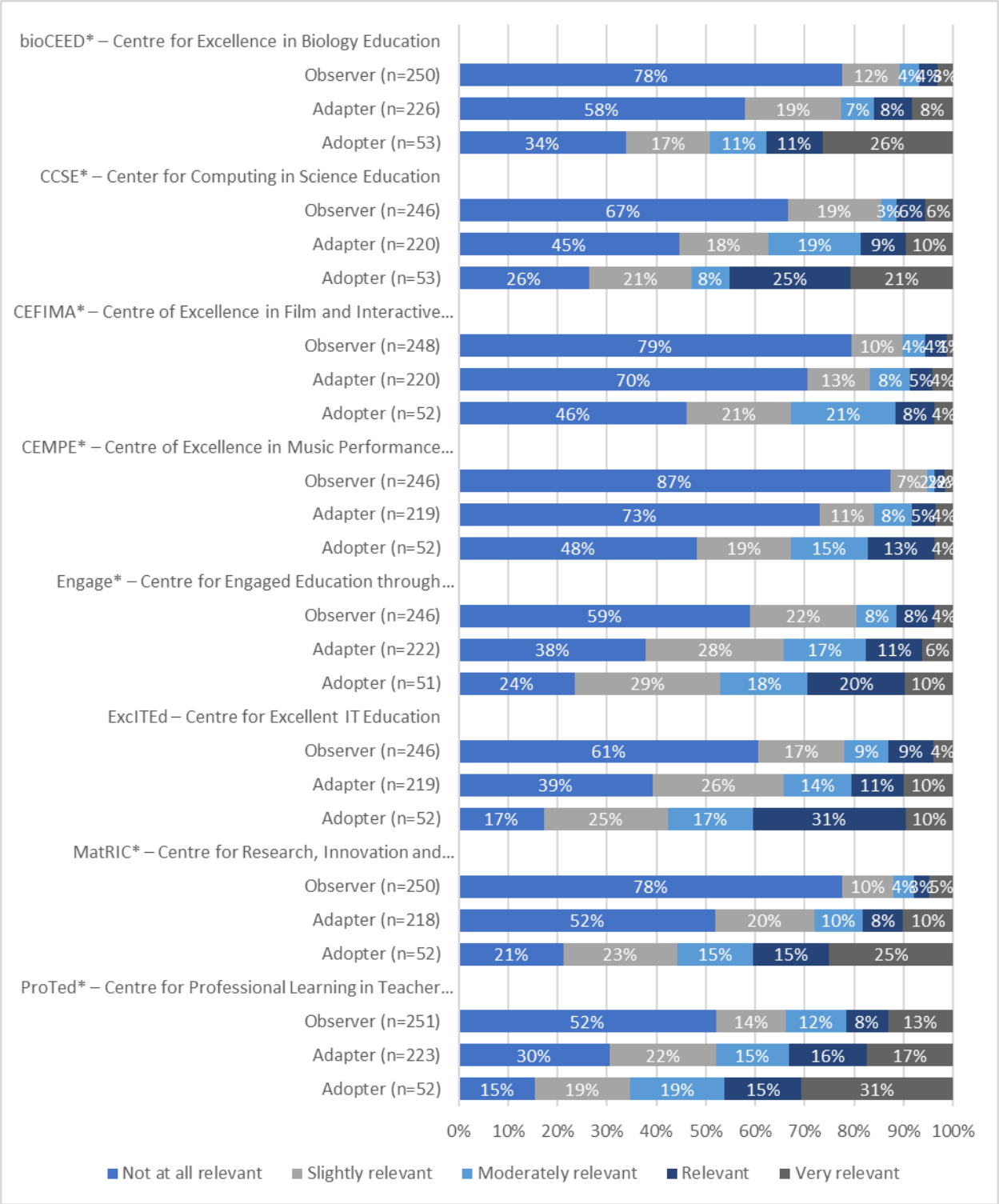
Source: CHEPS SFU-Survey 2019, Author's calculation, sig. 0.000

Figure 22: How frequently SFU Users heard about the SFUs, Question Q9.3: How frequently have you heard about the following SFU?, Percentages, Values: 1 'Never', 2 'Rarely', 3 'Occassionally', 4'Frequently', 5 'Very frequently'



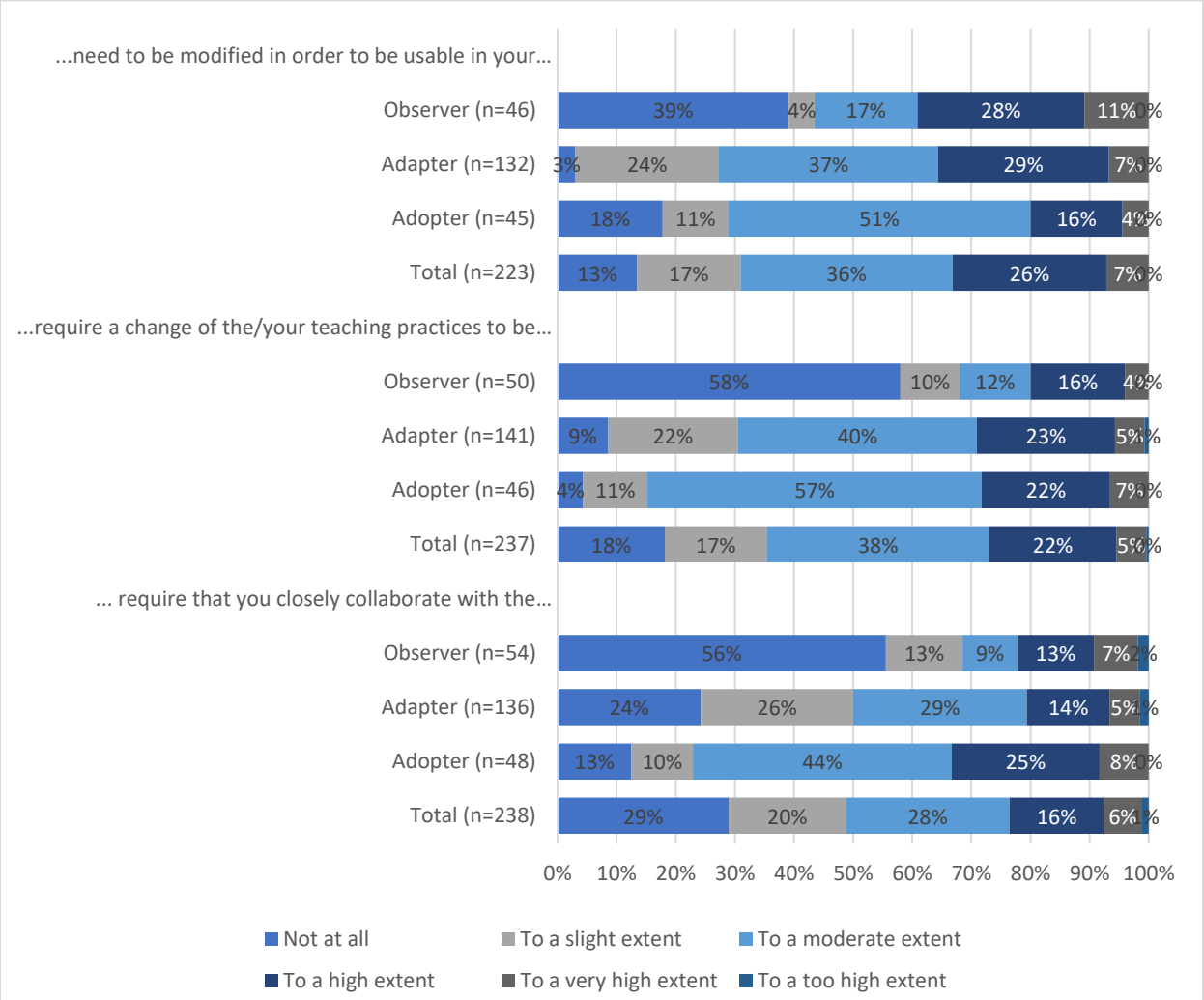
*Source: CHEPS-SFU Survey 2019; Author's calculations; * sig. ≤ 0.05 for User-Types*

Figure 23: Relevance of SFU, Question Q9.4 How relevant are the SFUs listed below for you?, Values from 1 'Not at all relevant' to 5 'Very relevant', %.



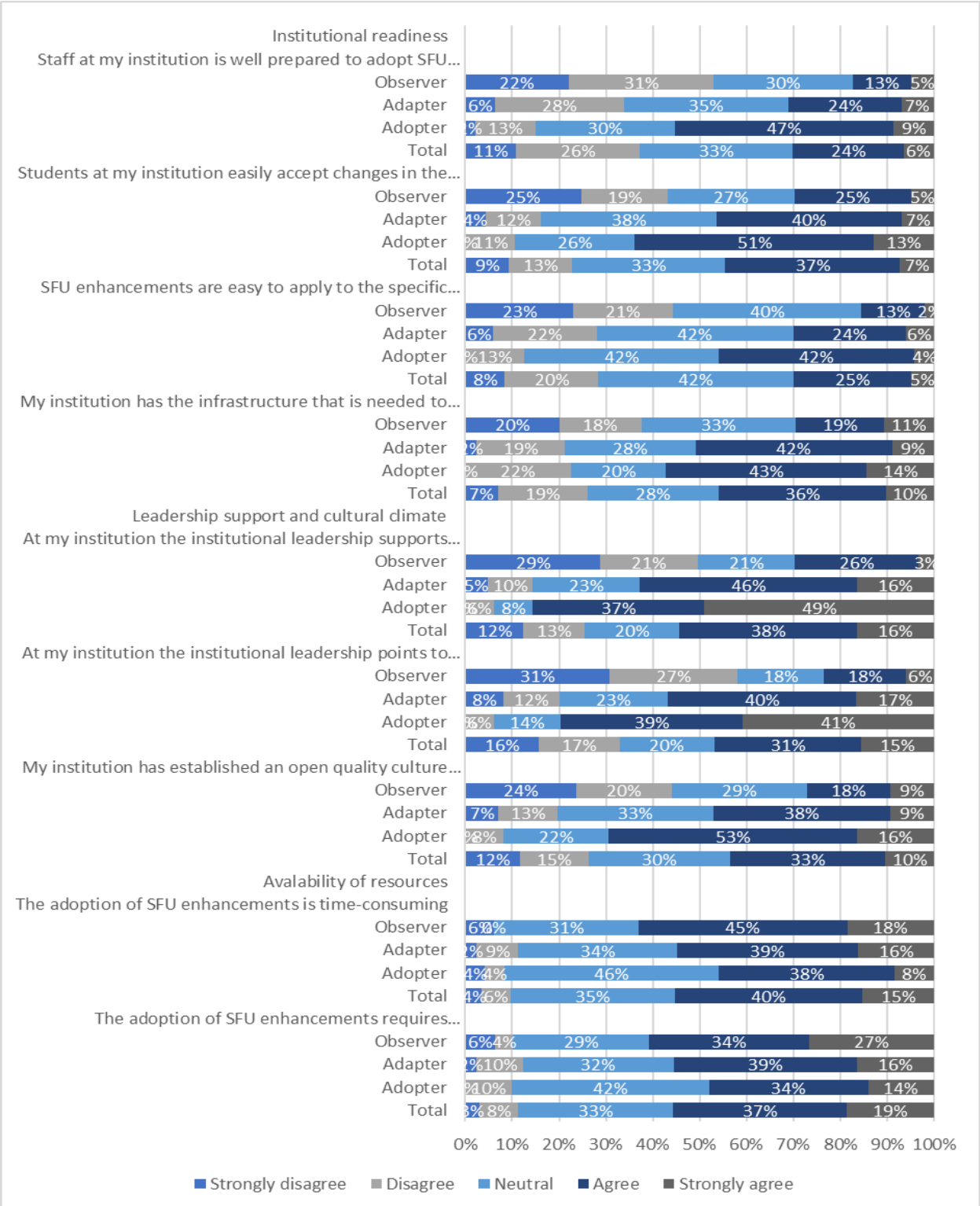
*Source: CHEPS SFU-Survey 2019, Author's calculation, * sig ≤ 0.05 for significant differences between user groups.*

Figure 24: Evaluation of SFU enhancements and SFU output, %, Questions Q14.2B and Q14.2AC Please rate to what extent SFU enhancements or other SFU output, Values 1 'Not at all', 2 'To a slight extent', 3 'To a moderate extent', 4 ' To a high extent', 5 'To a very high extent', 6 'To a too high extent'.



Source: CHEPS SFU-Survey 2019, Author's calculation, sig. 0.000

Figure 25: Evaluation of Institutional aspects supporting the use of SFU enhancements and other SFU output, %, Question Q15: How do you rate the aspects below for the adoption of SFU enhancements or other SFU output in your institution or in your work. Values -2 'strongly disagree', -1 'disagree', 0 'Neutral', 1 'agree', 2 'strongly agree'



Source: CHEPS SFU-Survey 2019, Author's calculation, sig. 0.000