

Perspectives on academic staff involvement in the acquisition and implementation of educational technologies

Abstract

This article presents the results of a study using both quantitative and qualitative data to uncover the extent and nature of the involvement of academic staff in the processes of acquisition and implementation of educational technologies. Actor-network theory (ANT) is used to inform the design of the study and the analysis of the data. Three main areas of investigation are: 1) issues of institutional policy and overall purpose of technology, 2) issues of staff involvement in various activities related to acquisition and use of technology, and 3) issues related to the existence of arenas for dialogue and discussions of technological needs and requirements across organisational boundaries. The analysis focuses on the diffuseness of the role of academic staff in processes of development of institutional policies and technology acquisition. The article concludes with suggestions for organizational policy in higher education contexts, and possible directions for new research.

Keywords: Higher Education, Actor-Network Theory, involvement, participation, educational technologies, decision making processes

Aim and research topic

Over the last few decades, educational technologies have become a ubiquitous and embedded part of Higher Education, and are generally regarded as an essential element of educational quality. Although the notion of educational quality does not lend itself to any straightforward definition (Wittek and Kvernbekk 2011), higher education institutions throughout the world rely increasingly on quality assurance processes, also when dealing with technology-enhanced teaching. Processes of quality assurance in education have been denounced as being ideologically constructed (Filippakou 2011), potentially biased and misleading (Poole 2010, Skolnik 2010), and permeated of bureaucratic logic (Cheng 2010). In that context, it is relevant to explore what role – or roles – academic staff members play in the pursuit of educational quality with the help of technology, how they relate to the technology that is meant to facilitate this pursuit, and what level of autonomy they experience within the realm of their organisation when participating in those processes.

Issues of participation and involvement of users are broadly recognized as central for the success of processes related to the implementation of new technology or to the development of existing technological solutions (Bjerknes, Ehn, and Kyng 1987, Grudin 1993). The increasing use of technology in education has brought the issue of participatory design of technology into a new context, and has raised a number of questions about the nature and the extent of student participation (Könings, Brand-Gruwelb, and van Merriënboer

2010). However, there is to our knowledge little empirical research that addresses issues related to the involvement of academic staff in the design of technologies.

It is therefore interesting to investigate whether and to what extent academic users of educational technologies are and feel involved in the decision making processes related to the choice of technological tools and the methods used for implementing them. Issues of participation and involvement are intimately related to the concept of power, which has received much attention within the field of Higher Education research, in particular in relation with the rise of managerialist modes of governance and corporate-like discourses in Higher Education institutions (Kolsaker 2008, Wood 2010).

This article aims to shed light onto those issues with the help of concepts from actor-network theory (ANT) and is structured as follows: first, we highlight our epistemological approach, which is a socio-material one. We then outline the methodology used and explain the rationale behind our choice of a triangular methodological approach. We then present the findings, and analyse them in the light of the notions identified as the core ANT concepts before concluding with a summary of the results and an overview of possible new research arenas.

Theoretical backdrop

Issues related to the use of educational technologies in Higher Education have been the object of a number of scholarly investigations, many of which are based on theoretical approaches and models such as the technology acceptance model (Edmunds, Thorpe, and Conole 2012) or some extension of that model (Elwood, Changchit, and Cutshall 2006), the theory of planned behaviour (Teo 2012), the diffusion of innovation model (Soffer, Nachmias, and Ram 2010), the Technological Pedagogical Content Knowledge framework (Abbitt 2011) and structuration theory (Hardaker and Singh 2011). A common denominator to those models and approaches is that technology - or innovation - is often considered a given, which the end-users may or may not accept, or may follow various paths towards acceptance. However, the literature on educational technologies in Higher Education rarely focuses on the involvement of end-users in processes of acquisition and implementation of technology at the organisational level.

In order to gain rich insights into issues of involvement of participation, there is a need for a theoretical framework that is both structured enough to enable analysis and flexible enough to capture the nuances and complexities of ensembles that involve both humans and technologies. Our choice fell on actor-network theory which we believed had great potential to guide us in our quest. Actor-network theory and other socio-material approaches stem originally from the field of social studies of technology and have been used over several decades to inform research within a number of related academic fields, including information systems (Walsham and Sahay 2006), human geography (e.g. Power 2005), anthropology (e.g. Campregher 2010), and healthcare studies (e.g. Petersson 2011). However, their use in educational research is relatively new (Sørensen 2009, Fenwick and Edwards 2010).

The original idea behind the notion of sociomateriality is that there is no clear-cut boundary between the realm of the social and that of the material. Scholars such as Sørensen (2009) and Hayles (1999) have outlined the necessity to consider the complexity that arises when information technology gets incorporated into human bodies and human life practices. What characterises sociomaterial perspectives is that they recognize that the social and the material aspects of everyday life, although they are conventionally conceptualised as distinct and discrete, are in reality so tightly entangled that they require a common analytical framework (Orlikowski 2007).

Amongst the various sociomaterial perspectives that have evolved over time, ANT is unique in that it proposes to structure the analysis of real-life descriptions and phenomena through the lens of a "principle of generalized symmetry", which is an explanatory model that describes humans and non-humans using the same terminological toolbox. One of the central elements of that toolbox is the notion of actor or *actant*, which can relate both to humans and non-humans. One definition of this notion is provided by Callon & Latour (1981) as "any element which bends space around itself, makes other elements dependent upon itself and translates their will into a language of its own" (page 286). Those actants relate to each other through networks or, more precisely, *actor networks*, which are heterogeneous ensembles of more or less tightly knit actants that have a common goal or set of goals.

One of the core concepts of ANT is that of *negotiation*, referring to the processes that occur when two or more actants that may originally have different goals or purposes try to "convince" one another to modify or adapt those goals and purposes in such a way that they will become "aligned", i.e. similar enough to be considered part of the same network. Such processes may be actual negotiations where arguments are put forward and weighed against goals and ideals. They may also take a more tacit form, for example when users of a particular technological tool experience the tool as inadequate, but adapt their needs to the tool because the financial or social cost of switching to a new tool would be too high.

The concept of *enrolment* is closely related to that of negotiation and refers to what occurs when one actant or a group of actants enlists other actants into their actions or practices, thereby increasing the odds of the action being performed or the practice being further established.

In ANT terms, a *black box* is a set of elements in a network that have become taken for granted. "A black box contains that which no longer needs to be reconsidered, those things whose contents have become a matter of indifference. The more elements one can place in black boxes – modes of thoughts, habits, forces and objects – the broader the construction one can raise." (Callon and Latour 1981, page 285). Typically, sets of ideas and arguments may become "blackboxed" when they have become accepted as a matter of fact and no longer questioned (Yonay 1994).

As mentioned above, the use of ANT within the field of education studies is relatively new. Although there have been some sporadic attempts to employ ANT-inspired approaches to inform educational research since the early 1990's (e.g. Nespor 1994, Verran 1999), there is little trace of widespread interest in the literature for such approaches before the last

decade. Since the beginning of the 21st century, there has been a growing interest within the realm of educational research for socio-material perspectives. Indeed, ANT seems to strike a chord among those scholars that are interested in eliciting the “messiness” of academic experience, especially as it contrasts with the “official story”, embedded for example in workload allocation systems (Malcolm and Zukas 2009). ANT-informed studies are no longer a rarity within the field of education, and their focus areas span from literacy (Edwards, Ivanic, and Mannion 2009) to educational policy (Decuypere, Simons, and Masschelein 2011) and academic management (Mulcahy and Perillo 2011). The study described in this article may be situated at the intersection of management-oriented educational research and pedagogy-oriented research, as it deals with issues related to the daily practices of academic staff in a Higher Education setting.

Setting of the research and methodology

The study described here is part of a research project aiming at expanding our understanding of the patterns of use of educational technology among academics, as well as comprehending their preferences in terms of technology use, and gaining insights in the place that technology plays in their relationships with other members of staff, including administrators, technical staff, management staff or other academics. The methodology used is a combination of a qualitative exploration of the concept of involvement (through interviews and self-reported logs) and a quantitative study of academic staff’s awareness of educational technologies, their patterns of use, and their level of participation in decisions regarding educational technologies.

Although ANT as a methodological approach has been described as “pick-and-mix” in nature (Cowan, Morgan, and McDermont 2009), it may be noted that ANT-oriented studies are traditionally mainly qualitative and explorative in nature, often based on narratives and text-based data (Latour 1988, 1996). Use of quantitative data in ANT-inspired research is relatively rare, with a few notable exceptions (e.g. Van der Duim and van Marwijk 2006). Because ANT-inspired approaches use the famous slogan “*follow the actor*”, they tend to be intensive and make use of methods assemblages. However, such methods tend to gravitate around observation-based ethnographies, which are not always suitable, especially in the case of multi-site projects. Our research cannot be qualified as project-based, but it is certainly multi-site, as it involves five different institutions of higher education in Norway. Therefore, the choice of combining quantitative and qualitative data seemed natural, although relatively innovative on the methodological front within the realm of ANT-informed research.

The qualitative part of the study was conducted first, based mainly on individual semi-structured interviews with 29 academic staff members from eight faculties at four of the five participating institutions. Those informants were strategically selected among colleagues of the researchers, based on the following purposive selection criteria (Miles and Huberman 1994): over-average interest in educational technologies, over-average proficiency in technology and longer-than-average experience in using educational technologies. Those interviewees were also asked to recommend colleagues with similar interests and experience

with educational technologies, whom the researchers then approached in a next round. The interviews were semi-structured, with a focus on the type of use of educational technology as well as the reasons behind the choices (or non-choices) of technology. All interviews involved questions about knowledge of institutional policies and about the existence of involvement arenas at the interviewee's institution.

The results from the qualitative study formed the basis of the design of a multi-national survey. At the national level, the study was carried out in collaboration with Norway Open Universities, which involved 740 academic respondents from 26 higher education institutions. However, for the purpose of this article, we chose to focus on the responses from those 171 academic staff members that belonged to the five institutions participating in the qualitative part of the study. Because the selection of informants was delegated to the academic management at the involved institutions, we do not know the exact number of persons that received the survey. Assuming that every academic manager followed the recommendations to send the survey to half of the staff in their department, a total of 1250 academics would have received the survey. However, from the informal feedback we have got from academic managers who admitted not forwarding the survey because it came at a busy time of the year or because they simply forgot about it, we can roughly estimate that between 500 and 600 academics received the survey at the five institutions studied in this article.

The survey included both questions regarding technology use among academic staff and questions aimed at uncovering their attitudes towards technology. In order to address the research question of how academics are and feel involved in the acquisition and implementation of educational technologies, we have first selected the three questions that we believed to be most closely related to the issue of involvement in the questionnaire. The issues emerging from the quantitative data then formed the basis of a new analysis of the qualitative data that had been gathered before the questionnaire was sent out.

Findings

We have chosen to present the findings in three subsections that refer to the three selected questions from the quantitative part of the study. Those relate to the following issues: 1) the reasons that academic staff have for using educational technologies, 2) their level and type of involvement in need mapping and acquisition of educational technologies, and 3) the extent to which staff members are part of discussions and dialogues around technology use.

The invisible institutional information and communication technology policy

Although all the institutions participating in this study have an institutional policy for information and communication technology (ICT), it is interesting to notice that the notion of institutional policy does not seem to be very present in the motivations of the staff as far as technology use is concerned (see

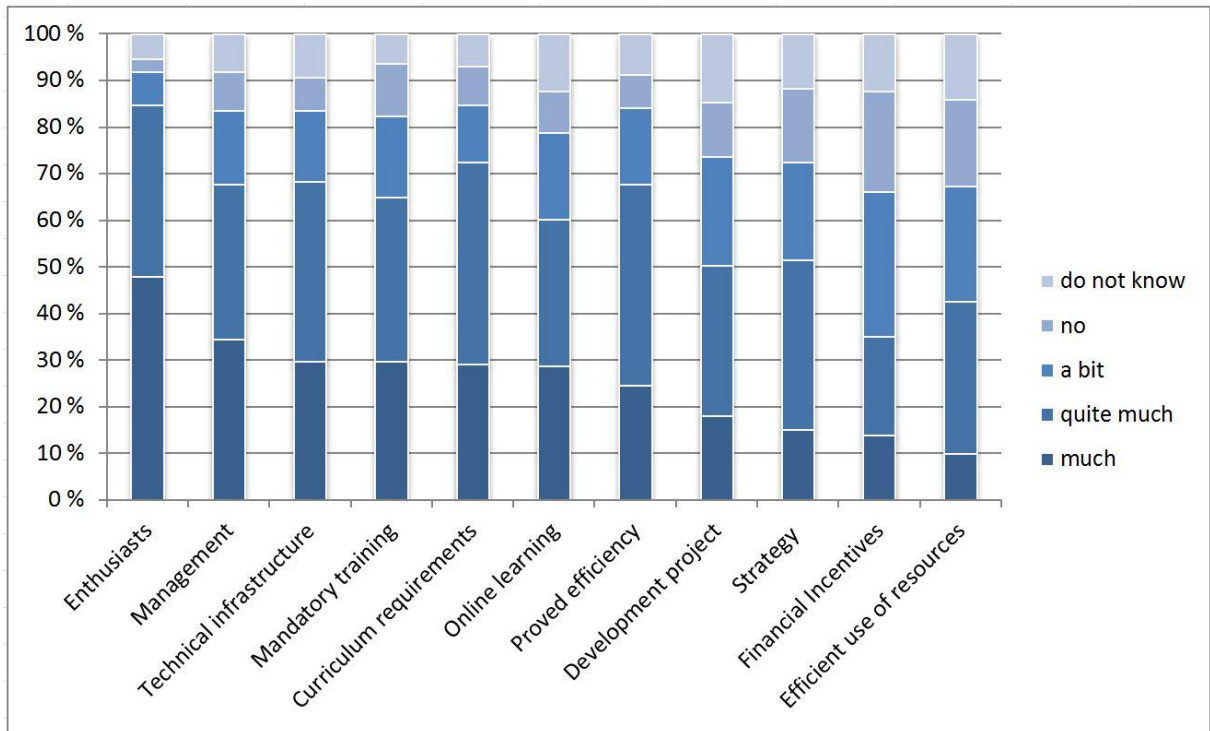


Figure 1 - Reasons for using educational technologies). Only 51.5% of the respondents express that they believe institutional policy to be important or very important, and even fewer (41.5%) consider their institution's requirements in terms of efficiency to be a motivating factor for the use of educational technologies.

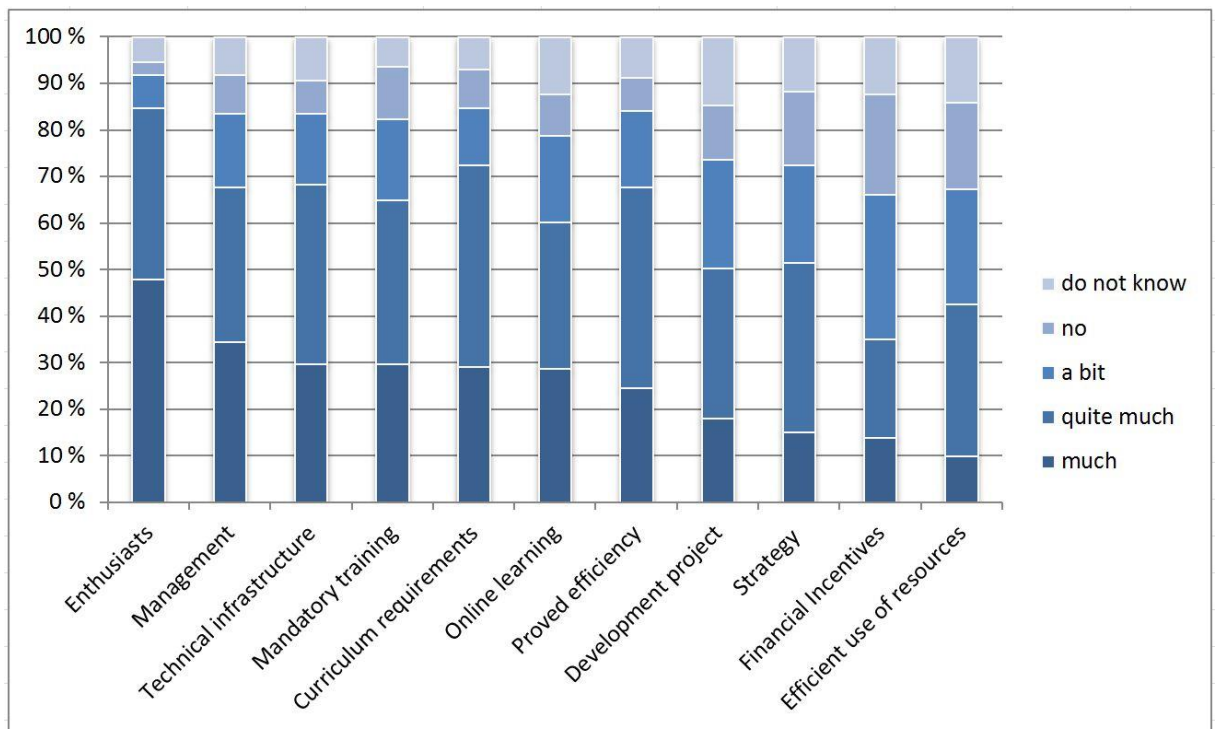


Figure 1 - Reasons for using educational technologies

The semi-structured interviews all included a series of questions about whether the informants were aware of institutional or national policies on use of information and communication technology in higher education, whereby the majority answered negatively:

Interviewer: Do you know [any of] the national regulations for ICT in higher education

Informant 1: I know that they exist...

Interviewer: How do you think the School and your department fulfil the regulations?

Informant 1: They undoubtedly have a great institutional policy... I just have no idea [what it is]!

Generally, the notions of ICT policy and of the purpose of using educational technologies are somewhat blurred among academic staff members, with little signs of engagement and enthusiasm for the issue.

Lack of arenas for involvement

It emerges from the quantitative data that academic staff respondents are generally little involved in the decision processes pertaining to the acquisition and implementation of educational technologies (see Figure 2). Only a minority (27 %) of the academic respondents express that they feel involved in the mapping of needs for educational technology, or in the actual choice of which educational technologies are to be implemented in their institution (24,5 %). Data from the questionnaire also uncover that only a minority of the respondents feel that the use of educational technologies is driven by the academic staff themselves (45,6 %). In an organisational landscape where employees are either academic or administrative (as is usual in Norwegian Higher Education), such a finding points towards the existence of a strong administrative dominance in the decision processes related to the acquisition and implementation of educational technologies.

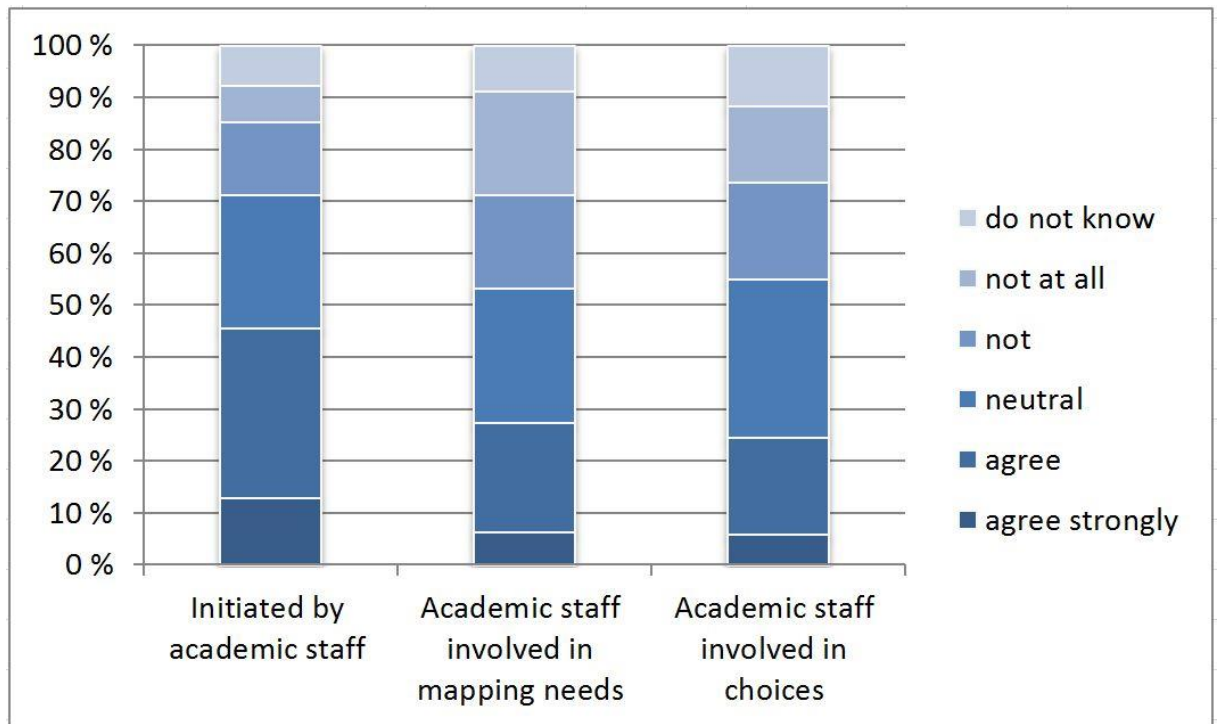


Figure 2 - Involvement of academic staff

Those findings are concurrent with those of the qualitative part of the research whereby nearly all informants describe not being involved in the process of acquiring and implementing software and hardware. A surprising high number of informants answer simply "no" to questions about whether they are involved in decisions in terms of acquisition, and are unable or unwilling to elaborate on why this is the case.

Interviewer: "Have you been involved in any process of acquisition?"

Informant 4: "No, absolutely not"

Informant 5: "As far as I know the academic staff haven't been involved [in the acquisition of ICT tools]"

The testimony of several informants points to a general lack of discursive and participatory processes around technology acquisition. They describe for example that persons sitting in committees in charge of evaluating various possible technological solutions and taking acquisition decisions are generally staff with a technical background or a particular interest in technology. It is interesting to note that many informants take this situation as a given, and suggest that they themselves have nothing to do in such committees because they lack special technical competence. They rarely question the unwritten and unspoken rule that such assignments are best left to expert users, some of whom were part of our panel and confirmed that state of affairs.

Informant 14: "[my participation in decision committees] has a lot to do with my special interest in the topic"

At the same time, several informants consider the decision-making processes related to educational technologies to be suboptimal. In particular, their personal accounts reveal poor levels of insight into the daily needs of the various academic and professional fields represented at their institutions. Several informants describe their actual needs as being often misunderstood, or simply ignored, presumably due to lack of involvement. This is described as problematic, especially because it has led to important ICT acquisition decisions being taken on the basis of unsubstantiated assumptions about the users' needs.

It is noteworthy to mention that expert committees work mostly on the acquisition of institution-wide hardware and software. For more punctual needs, such committees are rarely involved. However, the descriptions from the informants on how the acquisition of those other artefacts takes place also point towards a certain lack of involvement. Although some informants report that the process of acquisition was straightforward and trouble-free, the majority paint a picture of a system where procedures, although they are indispensable, are often hard to get hold of. Those informants report finding it difficult to identify which person or unit they need to relate to when expressing their needs for new technological artefacts. When they do find what they assume is the right person or unit, they are rarely satisfied with how the request is handled, both in terms of response time, and in terms of what else they need to do to get them delivered. It is interesting to see that there is a general lack of transparency regarding what equipment is standard and what is not, or even whether there is a standard at all.

Gap between rhetoric and practice

Data from the questionnaire point towards a gap between the apparent status of educational technologies among managers (i.e. how much academic respondents report that their managers encourage technology use), and how much those issues are actually a part of the daily pedagogical practice in the collegium (see

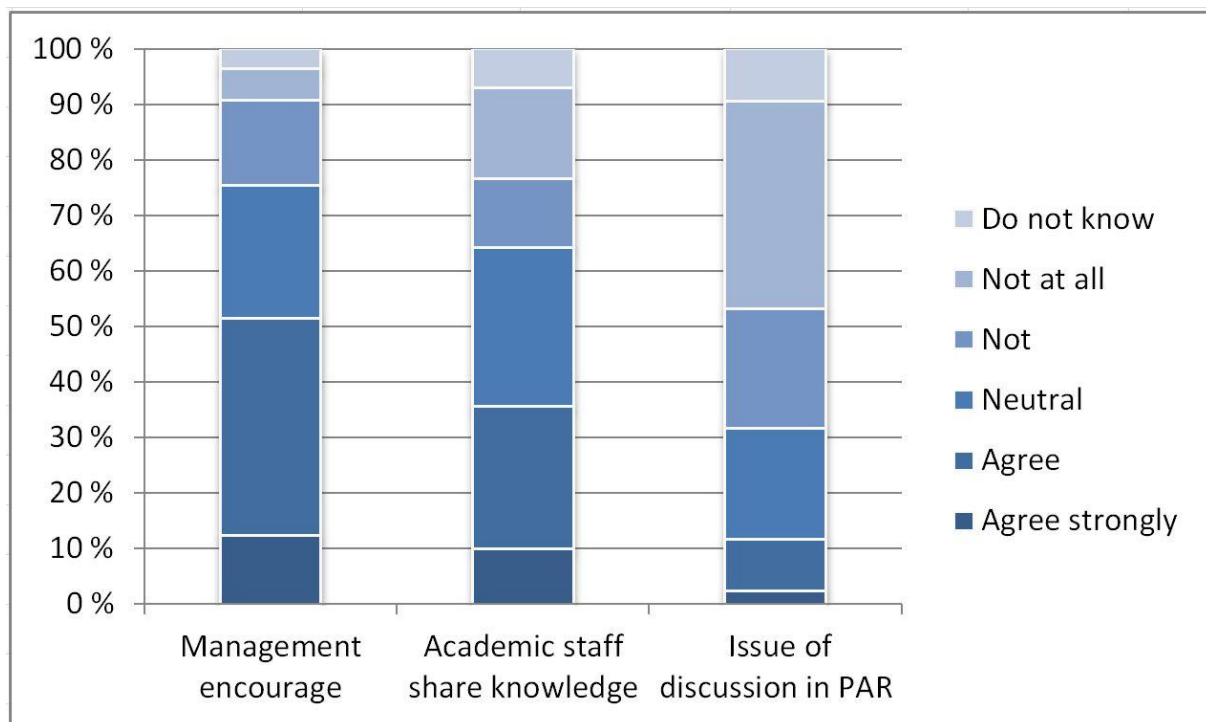


Figure 3 – Discussions and dialogues around educational technologies). Despite respondents reporting in majority that their management is encouraging the use of learning technologies (51.5%), few of them experience that those issues are discussed among academic colleagues (35.6%), and even less report that they are taken up as a part of the performance assessment reviews (PAR¹) (11,7 %) that are one of the main formal dialogue arenas between management staff and their direct subordinates at Norwegian workplaces (Kuvaas 2011, 2006).

¹ Due to the fact that most higher education in Norway is State-run, most higher education employees are government employees. Although PAR are not formally regulated by Norwegian law, the Staff manual for government employees strongly advises the use of PAR, as documented in the “comments” section (chapter 11.1.5.1) of the (Arbeidsdepartementet 2006, chapter 11.1.5.1)

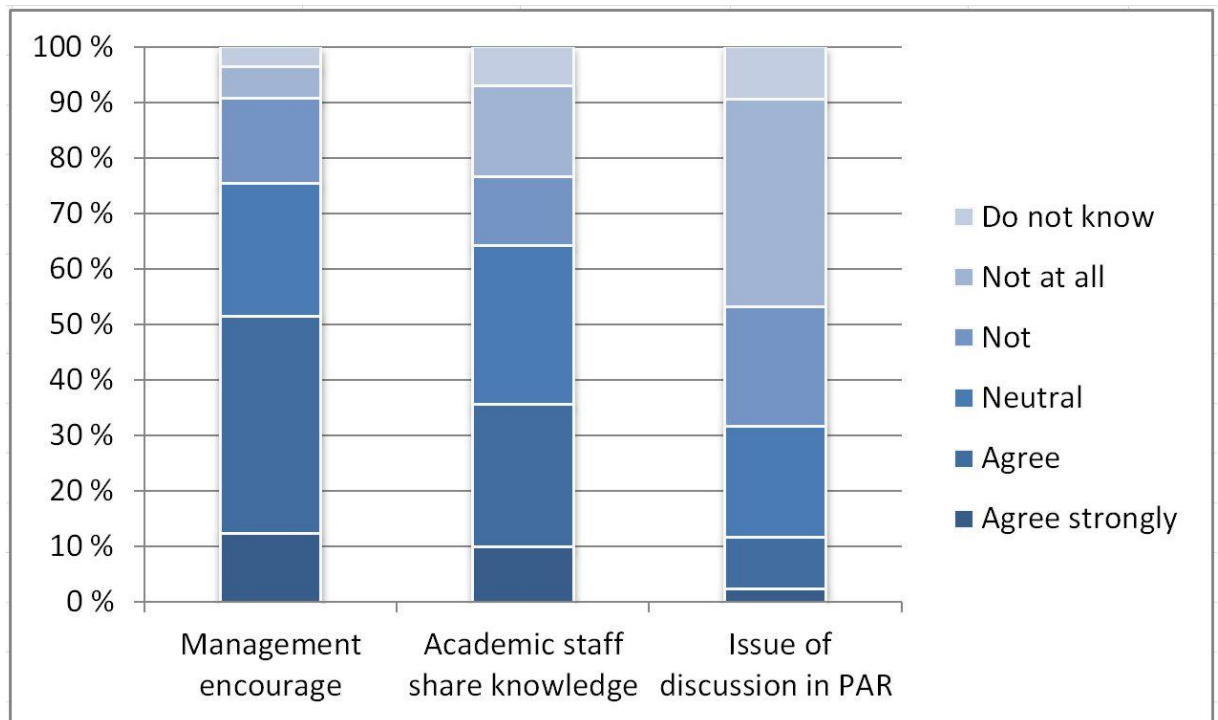


Figure 3 – Discussions and dialogues around educational technologies

Those findings are interesting in terms of how much involvement and participation actually takes place in Higher Education regarding technology use. They are all the more surprising that they contrast with the traditional view that Scandinavia is at the forefront in terms of employee involvement and participation (Levin 2002) especially in terms of design and use of technology (Bjerknes, Ehn, and Kyng 1987, Gregory 2003).

In the interview data we actually find little evidence of encouragement from managers to use technology, with a notable exception, that of virtual learning environments. In contrast, the informants' narratives of their quests for software or hardware that fall outside the institutions' standard packages or programmes are generally lengthy descriptions of difficult and cumbersome journeys throughout a bureaucratic and opaque system.

Analysis of the data

The data presented above points towards the existence of an important but not easily definable *actor network* around the processes of discussing, choosing and implementing educational technology in Higher Education. In this network, several human groups of actors appear to play a role, namely the academic staff themselves, the administrative staff at all levels, the technical staff, the academic management at the faculty/department level and the top management, in addition to non-human actants such as technological artefacts, institutional policies and goals, and the rhetorical arguments that are used to motivate actors to work towards them.

It emerges from the interviews that one of the main characteristics of this actor network is that it is oddly complex and confusing. Management is often referred to as a general and sometimes abstract entity, which is rarely spelled out in terms of whether it is middle management or top management, administrative or academic management, direct or indirect hierarchical superiors. Members of the technical support staff are also central in that network but little is known among the interviewed academics about who is in charge of providing such support, whether they are entitled to contact those colleagues, and if so, what are the legitimate communication forms and canals for making their needs known. This confusion seems to lead to a somewhat paradoxical situation whereby, on the one hand the idea of educational technology, is bequeathed a focal place in the network as it symbolises innovation, progress and effectiveness while, on the other hand, the very tangible technological artifacts that are meant to improve teaching in terms of quality and quantity seem interred in a labyrinth of administrative procedures and indistinct lines of authorization and clearance. Those two actants (the idea of the technology and the technology itself) therefore play two very different roles in the network.

Both the apparent fragmentation between the various groups constituting the network and the elusive place given to technology may impair necessary processes of *enrolment*. This very notion of enrolment is also in direct contrast with the received idea that only technology specialists should sit in decision-making committees, which might shed light on why many informants experience that those committees lack of insight into their specific needs. In addition, the data suggests that the acute gap between the pedagogical needs and the actual procurement of educational technologies is the result of disconnecting different types of expertise and that this disconnection is embodied in the structure of the procurement committees.

The ambiguities and opacities that seem to permeate the described actor network appear to affect the potential for participation, involvement, and, to use an ANT term, *negotiation* negatively. The informants' descriptions of processes that are short of democratic involvement, the absence of routines allowing users to provide information about their own needs, and user discontent regarding the nonexistence of standards all point towards a lack of negotiating power. It is fair to assume that an ambition of delivering high-quality education requires a shared understanding of the notion of quality. The data from this research suggest that the several groups of actors in the institutions studied are only loosely related to each other, with few arenas for communication and unclear communication canals. They may therefore miss opportunities to negotiate issues related to acquisition, implementation and use of educational technology. This may in term cause difficulties in reaching such a shared understanding, and, consequently, the level of educational quality they are striving to achieve.

The informants report that they often experience meeting (and being alienated by) *black-boxed* structures and procedures, which impairs the process of working together toward the same goal. In particular, pedagogy and technology are to some extent *blackboxed* as two distinct and almost discrete entities, which may counteract the very notion of “educational technologies”, and render it almost oxymoronic.

These numerous and intertwined *blackboxing* processes seem to be epitomic of situations where power is exerted in a somewhat diffuse way, and where the distinction between coercion and consent is blurred. According to Dean (2009), such conceptions of the relationship between power and liberty can be referred to as “governmental” and are characterised by techniques of governing that do not seek to shape the conditions under which individuals make choices, by rather to shape their preferences, perceptions and cognitions.

It may also be suggested that the ideal of academic freedom that reigns in many areas of higher education is threatened by a system that is steered with a very different logic, which is more bureaucratic and mostly expert-driven. In addition, the fact that the various actors involved in the system are hard to get hold of (or even remain mostly unknown to the common user) may be a considerable thwart to participation and involvement in decisions related to technology acquisition and use.

Conclusion

An investigation of the data using some of the core ANT concepts has uncovered that the network formed by educational technologies and its users and stakeholders is somewhat weak. In particular, we find that the processes of involvement and participation are not greatly present in the discourses of academics, and do not emerge as prevalent when looking at actual use of the technologies. The implementation of technology is often seen as something that “just happens”, and most respondents’ descriptions of how the decision making processes are carried out are at best vague and abstract.

An interesting finding is that few respondents are aware of the existence of policies related to use of technology, whether they were to be found at the national, institutional or faculty level. Educational technologies are generally mostly taken for granted, which may result in processes of blackboxing, which in turn may prevent frustrations arising in relation with technology use from translating into actual attempts to modify the technology or request modifications from the producer.

In an educational landscape where technology is playing an increasingly important role, the findings from this research indicate the existence of a substantial gap between the reality of teaching practice in academia, and the rhetoric of institutional policies and governance. This suggests that institutional policies may need to be developed through a closer collaboration between management and academic staff. Such collaboration requires a constant and consistent understanding that the requirements of academics in terms of technology need to constitute the point of departure for policies, systems and procedures.

Further research could entail going back to the respondents and interviewees from this study and trying to get more in-depth knowledge of the main areas of discrepancies. For example, the issues of invisible institutional policies, the lack of involvement of academic staff and the existence of seemingly impenetrable structures in terms of technology acquisition could be used as the main “entrance” themes for new interviews. It would also be interesting to expand the range of interviewees in a second round of interviews, this time

including managers, technical staff and administrative staff. Additionally, it would be of interest, within the realm of future research, to investigate how students are being involved in the processes described above.

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Appendix: Survey questions

The three questions extracted from the survey for the purpose of this article are as follows:

1. How important do you believe the following will be when it comes to increasing the use of educational technologies at your institution?

- a) Institutional policies and plans
- b) Support from the management and the rest of the organisation
- c) Enthusiastic academic staff who burn for the idea of using educational technologies
- d) The use of educational technologies and media is integrated in teaching plans and compulsory assessment
- e) Compulsory training for the academic staff
- f) Better access to technical equipment at your institution
- g) Financial incentives
- h) Development projects
- i) Expectations of better use of resources
- j) Documented good experiences
- k) Development of flexible study programmes

2. How well or poorly do the following (statements) fit when it comes to choosing and implementing information and communication technology in your department / division?

- a) The use of educational technology and media is initiated and carried out by the academic staff
- b) The academic staff are involved in mapping the requirements for educational technology and media
- c) The academic staff are involved in choosing the actual educational technologies and media that will be implemented

3. How well or poorly do the following statements describe the reality in your department/division?

- a) The management encourages the educational use of technology
- b) The academic staff share knowledge and experiences about their own use of educational technologies
- c) The use of educational technologies is discussed in the Performance Assessment Review of the academic staff