Developing scholarly communities as learning environments for doctoral students

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PLEASE SCROLL DOWN FOR ARTICLE

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The quality of PhD training can be conceived of as being dependent on the learning environment provided by the scholarly community. Our paper explores PhD students' ideas about themselves as a part of this community, and their perceptions of their learning environment in the context of the University of Helsinki, Finland. The study is a part of a larger national research project. The present study includes data collected from three faculties: arts, medicine, and behavioral sciences. Altogether, 602 doctoral candidates responded to the survey. Results suggested that both the definitions of "scholarly community" given by the students and their experience of membership in this very community varied considerably. About one third of the PhD students did not perceive themselves as being members of any scholarly community at all. There appears to be an urgent need for more effective means of fostering PhD students' experience of active agency within scholarly communities.

La qualité de la formation doctorale peut être envisagée sous l'angle de sa dépendance à l'égard de l'environnement d'apprentissage mis en place par la communauté académique. Cet article explore les idées entretenues par les doctorants à l'égard d'eux-mêmes au sein de cette communauté, de même que leurs perceptions à l'égard de l'environnement d'apprentissage. Les résultat d'un sondage effectué auprès de 602 doctorants suggèrent que les définitions de « communauté académique » fournies par les étudiants et leur expérience d'appartenance à cette communauté varient considérablement. Il semble qu'il y ait un besoin urgent de mettre en place des moyens davantage efficaces pour favoriser une expérience de participation active (*active agency*) des doctorants au sein des communautés académiques.

Tiedeyhteisö muodostaa jatko-opiskelijan keskeisen oppimisympäristön. Tässä artikkelissa keskitymme analysoimaan suomalaisten jatko-opiskelijoiden käsityksiä omasta tiedeyhteisöstään ja itsestään sen jäseninä. Tutkimusaineisto on kerätty osana laajempaa Helsingin yliopistossa käynnissä olevaa "Jatko-opiskelijasta tieteelliseksi asiantuntijaksi" – tutkimushanketta. Aineisto kerättiin kyselyllä, johon vastasi yhteensä 602 humanistisen, lääketieteellisen ja käyttäytymistieteellisen tiedekunnan tohtoriopiskelijaa. Tulokset osoittivat, että opiskelijoiden käsitykset tiedeyhteisöstään ja omasta roolistaan sen jäseninä vaihtelivat. Enemmistö opiskelijoista koki kuuluvansa johonkin tiedeyhteisöön. Samanaikaisesti kolmannes opiskelijoista koki itsensä ulkopuolisiksi. Se miten jatko-opiskelijat oman roolinsa tiedeyhteisössä kokivat, oli yhteydessä opiskelijan kokemaan hyvinvointiin ja opintoihin sitoutumiseen.

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Keywords: doctoral education; scholarly community; doctoral students' perceptions about their learning environment; stress

Introduction: the scholarly community as a learning environment for PhD students

Doctoral studies always take place within a particular context and are influenced by the social practices of the scholarly community in question. A scholarly community provides a learning environment that includes various complementary elements such as supervision, knowledge, learning and assessment practices, as well as the physical learning environment (Gardner, 2007). The experience of the learning environment may affect, for example, PhD students' professional identity and the development of expertise.

The relationship between a PhD student and their learning environment is mediated by individual attributes such as students' and their supervisors' prior learning experience, goals and strategies, and situational factors (Murphy, Bain & Conrad, 2007). This means, for example, that PhD student's (mis)conceptions of thesis work and of themselves as scholars mediate the process of learning (Murtonen, 2005; Åkerlind, 2008). Although PhD students are a highly selected and talented group, they do have culturally driven spontaneous representations about the PhD process or of conducting scholarly research that may be contradictory with existing scientific conceptions. Therefore, it is important that students are provided with the opportunity to process these implicit theories of conducting research during their studies. This helps to identify default assumptions in one's representations and coping strategies. The process of reflecting also helps to discover essential problems in the domain of study itself. Such insights can then be formulated into questions and problems to be solved during the process of becoming a professional researcher.

Similarly, supervision practices are influenced by the supervisor's ideas of supervision, research (Brew, 2001; Kiley & Mullins, 2005) or knowledge. Postgraduate and undergraduate students' perceptions about their learning environment have been shown to be related to the way teachers approach teaching and supervision, and to their ideas of research (Trigwell, Prosser & Waterhouse, 1999; Sambrook, Stewart & Roberts, 2008). Furthermore, Watkins (2001) found in his meta-analysis that important aspects of university students' perceptions of their learning environment were an experienced heavy workload, a hard study pace and the experience of not getting feedback. These negative experiences were often related to surface approaches of learning or non-functional learning practices. Hence, it is important to take into account PhD students' perceptions of their learning environment when analyzing the quality of PhD education.

There is a constant dynamic interplay between the learner and their learning environment that may either promote or inhibit meaningful learning (Vermunt & Verloop, 1999; Lindblom-Ylänne & Lonka, 2000a). It has been shown that open learning environments that require student's own initiative, planning, experimentation and reflection in collaboration with peers and senior members of scholarly community may promote meaningful learning (John-Steiner, 2000; Mandel, Gruber & Renkel, 1996; Moss & Kubacki, 2007; Rothe et al., 2007; Soini, 1999).

Biggs (1999) used the concept of "constructive alignment" to describe an ideal learning environment in which students would aim at understanding of the learning material, and in which all aspects of supervision and assessment are aligned to, and

support, these efforts. An ideal learning environment for learning researcher expertise would provide *shared* control, where supervisors and senior members of a scholarly community would intentionally facilitate and promote learning by using activating and student-centered methods in order to help PhD students develop their research skills (Styles & Radloff, 2001). This process would then create a *constructive friction* (Vermunt & Verloop, 1999); the urge to develop gradually more and more sophisticated academic skills and knowledge. In turn, destructive friction may inhibit meaningful and self-regulative learning within PhD education and increase the risk of dropping out. For instance, Vermunt and Verloop (1999) proposed that when the learning environment is authoritarian and strictly teacher-controlled, students who are self-regulated may experience a destructive friction when they are trying to adapt. Lindblom-Ylänne and Lonka (1998, 2001) empirically demonstrated such destructive frictions in a traditional medical school among undergraduate students. They also demonstrated a constructive friction in a psychology program where student activating methods were introduced (Lindblom-Ylänne & Lonka, 2000b). If, on the other hand, the learning environment is loose, that is, not enough guidance and support is given, students may experience another kind of destructive friction and experience helplessness.

It is possible that continuous destructive frictions between students and learning environments may lead to study problems. Mental distress during education may have a negative impact and lead to withdrawal from study. Lonka et al. (2008) developed the MED NORD questionnaire in order to investigate medical students' well-being. This instrument is a combination of several measures that have been proven to be reliable and valid in previous research (Elo, Leppänen & Jahkola, 2003: Dahlin, Joneborg & Runeson, 2005; Mäkinen, Olkinuora & Lonka, 2004). Lonka et al. (2008) found that exhaustion, anxiety and stress composed a factor named "dysfunctional study orientation". This orientation correlated positively with disengagement, experiencing a high workload and worrying. It also correlated negatively with satisfaction and the feeling of getting enough feedback. There was also a significant negative correlation between dysfunctional orientation and reported grades.

On the basis of previous research on undergraduate students it may also be assumed that the experience of PhD training may be highly dependent on the learning environment provided by the scholarly community. This environment may promote either well-being and satisfaction or dysfunctional emotions and withdrawal from study. The goal of the present study was to explore the factors that potentially promote or hinder a successful PhD process.

The research design

The context of the study

This study is a part of a larger national research project (2006–2008) on PhD education in Finland that aims to understand the process of PhD education from four complementary perspectives: (a) central regulators and preconditions for a successful PhD process; (b) student–supervisor interactions during the supervision process; (c) the dynamics of research groups as learning environments for fostering academic expertise and literacy; and (d) describing the best practices of postgraduate training. The work is and has been carried out by using multiple methods (surveys, participant observations, mind-maps and interviews). The data have been collected at three

different levels of PhD education from: (a) students; (b) supervisors; and (c) scientific communities (e.g. research groups or seminars).

The part of the study reported in this article aims to gain better understanding of Finnish doctoral students' perceptions of their learning environment as well as their conceptions of the scholarly community and themselves as members of the community. Furthermore, the aim is to understand better how perceptions of the learning environment are related to well-being and study persistence. The study included survey data collected from three faculties at the Helsinki University: arts, medicine, and behavioral sciences (psychology and educational science). A total of 602 (441 female; 158 male; mean age = 38; median = 35) doctoral candidates responded in the baseline survey. All the participants were in different phases of their doctoral studies and they all had either Master's or licentiate degrees. The total response rate was 38.4%.

Measurements and data collection

This paper focuses on questions that addressed students' ideas about the scholarly community, their perceptions about their learning environment and well-being. The survey and instructions were validated in a pilot study before conducting the survey in research contexts. A total of 45 PhD students majoring in natural sciences participated in this pilot in January 2006.

The PhD student survey was conducted in May 2006. The survey consisted of both Likert- type statements and open-ended questions. The themes of the survey were: PhD students' ideas of the PhD process and its main regulators (e.g., problems and critical incidents); perceptions of themselves as a part of the scientific community; and the student–supervisor interaction. The PhD student survey contained a total of 81 questions: eight open-ended questions, 55 Likert-type statements (one item from the learning environment scale was excluded from the construction of summary variables) and 18 background variables. PhD students' perceptions of their learning environment, experienced stress, anxiety and ideas about academic writing and themselves as writers were measured using 14 scales including 49 items. It took about 30–45 minutes to complete the survey.

The instrument

The PhD students' perceptions of the scholarly community and themselves as a part of the community were explored with the open ended question "How do you perceive your role in your scholarly community?". Doctoral students' perceptions of their learning environment and their well-being were explored using a modified version of the MED NORD questionnaire that was developed to measure medical students' experiences of stress, anxiety and disinterest, motivational strategies and conceptions of learning, knowledge (epistemologies) and approaches to learning. (Lonka et al., 2008). Table 1 shows that students' perceptions of their learning environments were measured with 14 items that formed the following scales: (1) Atmosphere; (2) Receiving feedback; (3) Workload; (4) Worry; and (5) Satisfaction (modified from Dahlin et al. (2005)). PhD students' well-being was measured with 10 modified MED NORD items that measured Stress (Elo et al., 2003), Exhaustion (modified from Maslach and Jackson (1981)), and Anxiety and Lack of interest modified from the Inventory of General Study Orientations (IGSO) (Mäkinen et al., 2004).

Table 1. The modified MED NORD items included in the questionnaire.

Scale	Items included in the scale
Atmosphere	"Doctoral education enhances a cold and impersonal attitude"
	"Doctoral education creates isolation and anonymity among students"
	"Relationships between doctoral students are very competitive"
Receiving feedback	"My supervisors are supportive and I get personal attention from them"
	"I often get constructive feedback on my knowledge and skills"
	"I am treated respectfully"
Workload	"I worry, that I do not qualify for doctoral degree"
	"The pace of doctoral studies is too high"
Worry	"I am worried about my professional career"
	"I am worried about the stress level in my job after my doctoral degree"
Satisfaction	"I find my career choice satisfying"
	"Doctoral studies stimulate my personal development"
	"I feel that doctoral education provides adequate preparation for my profession"
Exhaustion	"I feel exhausted"
	"My workload is often too high"
	"Doctoral studies are too stressful for me"
	"I worry about the thesis in my free time"
Anxiety	"I often fear that I will fail in my doctoral studies"
	"I am stressed out by the workload, deadlines and competition in doctoral studies"
	"I often have to force myself to work for my thesis"
Lack of interest	"It is difficult for me to find meaning in my doctoral studies"
	"I am not motivated by the content of my studies"

Moreover, background variables (margin between starting year and estimated graduation year) were explored to find out whether there were differences in perceptions of scholarly community between those students who had considered dropping out of their studies and those who had not, and whether the perceptions were related to prolongation of studies (limit for prolongation was over 10 years).

Analyses

The open-ended question on students' role in the scholarly community was content analyzed using an abductive strategy. The strategy of the content analyses was thus compatible with the idea of the hermeneutic circle; continuous dialogue was maintained between the theoretical presumptions and the phenomena manifested in the empirical data. Empirical findings and theoretical ideas took turns and completed each other, gradually, resulting in the final categories. The analysis constituted three exclusive categories: (a) *member of scholarly community:* perceiving oneself as a member of scholarly community; (b) *outsiders*: not perceiving oneself as member of any scholarly community; and (c) *incoherent role*: those students who considered their role contradictory or whose idea about their role was unclear. Categories resulting from the content analysis were validated by the research group at the end of each analysis phase (Miles & Huberman, 1994; Yin, 1994). Moreover, the ecological validity of findings was

tested and verified in pedagogical courses for PhD students in which researchers and PhD students reflected together on the results (Bryman, 2004; Creswell, 2003).

Statistical analyses on modified MED NORD questions were carried out to measure the internal consistency (Cronbach's alpha) of the scales adopted in this study. The scales consisted of particular variables and they were based on a principal component analysis performed with Varimax rotation by using SPSS version 15.0.

A one-way analysis of variance (ANOVA) (significance level $p < 0.05$) was carried out to find out if there were differences in conceptions of the learning environment based on how doctoral student's perceived their role in their scholarly community. The relationship between well-being and conceptions of the learning environment was measured with a Pearson product–moment correlation. In addition, relations between study context and perceptions of one's own role in a scholarly community were measured with a Chi-squared test (significance level $p < 0.05$). Differences in study persistence based on conceptions of the learning environment were measured using Student's *t*-test (significance level $p < 0.05$).

Results

PhD students as members of a scholarly community?

More than half (55%) of the PhD students perceived themselves as members of some scholarly community, though different meanings and interpretations of this perception existed:

> In a way, I see myself still as a student, but at the same time I'm taking my first steps as an independent researcher. I plan on participating more in conferences in the future, so I can get more contacts, which are in my opinion very important for a PhD student in order to integrate.

> An MA is scum, whose degree is worth nothing. A white collar slave, whose job is to sell his soul with a minimum salary and to work 24/7 and eventually burn out, while the director just collects the money and the honour.

Definitions of "scholarly community" given by the students varied considerably, ranging from "a research group" to "the international community". Also, the experience of membership in the community varied, from seeing one's self as a junior researcher or a student, to just seeing one's self as cheap labor. At the same time, about a third (29%) of the students did not perceive themselves to be members of any scholarly community at all. Hence they considered themselves to be outsiders of the community.

> I'm an outsider, because I don't belong to any research group and therefore I don't have a feeling of relatedness. As a PhD student I would like to be a part of a community of researchers already.

A minority of the PhD students experienced their role either as contradictory (7%) or did not have any idea about their own role in the community (9%). We refer to this group as incoherent:

> It varies a lot. Sometimes you can contribute something meaningful and participate in the so-called academic activity. Sometimes you are a burden and you feel ashamed of yourself.

> These are really tough questions. I don't quite understand this. Apparently, [my role as a PhD student is] pretty good, but I don't understand why, because I have no proof of it or much to give to the scholarly community.

Table 2.   Cross-tabulation of the study context and the perceived role in the scholarly community (*n* = 602).

Academic affiliation	Member	Outsider	Incoherent	Total
Faculty of Arts	179 (55.2%)	91 (28.1%)	54 (16.7%)	324 (100.0%)
Faculty of Medicine	82 (61.7%)	34 (25.6%)	17 (12.8%)	133 (100.0%)
Department of Education	13 (31.7%)	20 (48.8%)	8 (19.5%)	41 (100.0%)
Department of Psychology	23 (54.8%)	11 (26.2%)	8 (19.0%)	42 (100.0%)
Total	297 (55.0%)	156 (28.9%)	87 (16.1%)	540 (100.0%)

Furthermore, these categories were cross-tabulated with the study context to find out if there was a relationship between the students' perceptions of their role in the scholarly community and the discipline.

The results indicated that there was significant variation between the four research disciplines. The relation between the discipline and the perceived role in the scholarly community was statistically significant (χ^2 = 0.044, df = 6, $p < 0.05$).

Most of the PhD students majoring in medicine, arts and psychology perceived themselves as members of scholarly community. At the same time about one third of the PhD students within these contexts perceived themselves as outsiders of scholarly community. The education PhD students felt most isolated, with the most dominant category within this context being the students that perceived themselves as outsiders of scholarly community.

Perceptions about the learning environment and experienced stress

The descriptive analyses of the scales with number of items, internal consistency (Cronbach's alpha), scale means, standard deviations and Likert points are presented in Table 3. The results show that the reliability (alpha) is satisfactory or good for each scale adopted in this study. The only alpha levels below 0.60 were for Satisfaction 0.505, Worry 0.508, and Workload 0.582.

Table 3.   Descriptive analyses of the scales (*n* = 602), number of items (*N*), internal consistency (Cronbach's alpha), scales' mean values, standard deviations (*SD*), and minimum and maximum values.

Items	*N*	Alpha	Mean	*SD*	Min.	Max.
Stress						
Stress	1	–	2.8	1.17	1.00	5.00
Exhaustion	4	0.824	2.8	0.92	1.00	5.00
Lack of interest	2	0.775	2.1	1.07	1.00	5.00
Anxiety	3	0.651	2.7	0.97	1.00	5.00
Perceptions of the learning environment						
Feedback	3	0.754	3.2	0.94	1.00	5.00
Workload	2	0.582	2.4	0.78	1.00	5.00
Satisfaction	3	0.505	3.7	0.71	1.33	5.00
Poor atmosphere	3	0.663	2.5	0.83	1.00	5.00
Worry	2	0.508	3.0	1.11	1.00	5.00

Correlations among variables

Table 4 shows that students who perceived their learning environment more negatively than others also expressed more stress, exhaustion, anxiety and lack of interest. Negative attributes such as worry, an overly high workload and discontent with the atmosphere of the learning environment had a significant positive correlation with stress, exhaustion, anxiety and lack of interest.

Those students who were most satisfied with their learning environment and experienced receiving feedback reported the lowest levels of stress, exhaustion and anxiety. They also reported less lack of interest in their studies. Self-reported feedback and satisfaction with studies correlated negatively with Worry, Poor atmosphere, Lack of interest, Anxiety, Exhaustion and Stress, all of which were positively related to each other.

Further investigation showed that those students who had considered withdrawing from their studies were more worried about their professional future ($t = 5.881$ df $= 587$ $p = 0.000$), were less satisfied with their studies ($t = -7.635$ df $= 588$ $p = 0.000$), experienced a poorer atmosphere ($t = 5.361$ df $= 587$ $p = 0.000$), experienced receiving less feedback ($t = -5.837$ df $= 528.117$ $p = 0.000$) and reported higher workloads ($t = 3.282$ df $= 530.951$ $p = 0.001$), than those who had not considered withdrawing from their studies. Moreover, those students whose studies were not prolonged were more satisfied with their studies ($t = -2.307$ df $= 104.422$ $p = 0.023$), perceived receiving more feedback ($t = -3.101$ df $=106.522$ $p = 0.002$) and were also more satisfied with the atmosphere of their learning environment ($t=1.991$ df $=507$ $p = 0.047$) than students whose studies were prolonged (10 years or longer).

PhD students' perceptions about the learning environment and their roles in the scholarly community

Figure 1 shows that those PhD students who perceived themselves as members of the scientific community reported the highest level of received feedback. They were also most satisfied with the atmosphere of their learning environment.

Table 4. Pearson correlations between perceptions of the learning environment, stress, exhaustion, anxiety and lack of interest ($n = 602$).

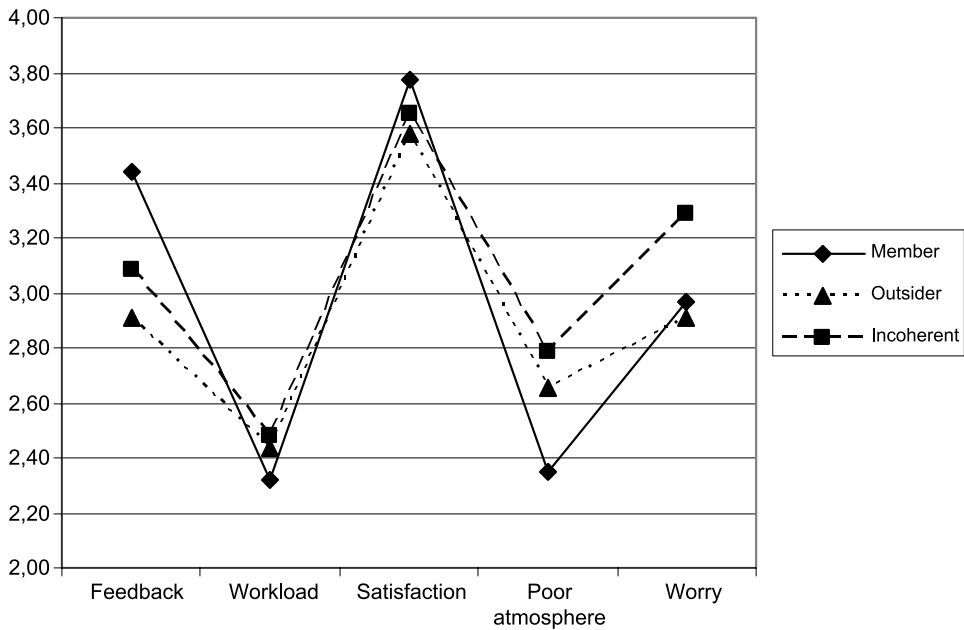|	1	2	3	4	5	6	7	8
1. Stress (1 item)								
2. Exhaustion	0.675**							
3. Anxiety	0.536**	0.588*						
4. Lack of interest	0.250**	0.275**	0.448**					
5. Feedback	−0.207**	−0.230**	−0.241**	−0.258**				
6. Workload	−0.221**	0.244**	0.413**	0.163**	−0.028			
7. Satisfaction	−0.165**	−0.220**	−0.224**	−0.524**	0.348**	−0.032		
8. Poor atmosphere	0.228**	0.278**	0.312**	0.287**	−0.349**	0.157**	−0.347**	
9. Worry	0.390**	0.440**	0.478**	0.326**	−0.166**	0.152**	−0.262**	0.322**

Note: *$p < 0.05$; **$p < 0.001$

Figure 1.   Differences in conceptions of learning environment (scale means) between different postgraduates.

Those PhD students who had an incoherent perception about their role in the scholarly community were the most worried about their professional future and were the most discontented with the atmosphere of their learning environment. Moreover, the outsiders who did not consider themselves to be members of any scholarly community reported the lowest levels of feedback and satisfaction with their studies. The differences between the three groups was statistically significant in terms of feedback ($F = 19.286$, df = 2, $p = 0.000$), satisfaction ($F = 4.277$, df = 2, $p = 0.014$), poor atmosphere ($F = 13.114$, df = 2, $p = 0.000$) and how worried students were about their professional future ($F = 3.548$, df = 2, $p = 0.029$). The PhD students who considered themselves to be members of a scholarly community experienced the highest amount of feedback, the most satisfaction and were least likely to experience a poor atmosphere. In terms of feedback, these students differed significantly (Scheffe *post hoc*) both from outsiders ($p = 0.000$) and students who had an incoherent ($p = 0.005$) perception of their role. Members differed from outsiders ($p = 0.018$) also in terms of satisfaction and poor atmosphere ($p = 0.001$). At the same time, the experience of an incoherent role was related to the highest levels of worrying and also to the poorest atmosphere ($p = 0.000$). In the measure "Worry", differences were found between outsiders and those whose perception about their role was incoherent ($p = 0.040$).

Conclusion and discussion

Our results demonstrate that there was a great variation in terms of how the PhD students experienced their learning environment. We are alarmed by the proportion (almost 30%) of the students who felt that they were not part of a scholarly community. The domain of Education appeared to be the most isolating in terms of membership in the scholarly community. This may have to do with the nature of the study; in

medicine and psychology it is more common to work in research groups. In Finland, the typical form of publishing in education is a monograph written by a single scholar. In humanities there is a great variation of domains, ranging from individualistic philosophers to archeology groups.

There also appeared to be a clear relationship between perception of the learning environment, well-being and persistence in studying. Those who had considered interrupting their PhD studies also more often expressed worrying, poor atmosphere, receiving less feedback and higher workload. In contrast, positive experiences of satisfaction, feedback and atmosphere were more typical among those who had not considered interrupting their studies.

In terms of the learning environment, the profiles of "members", "outsiders" and "incoherent" experiences were similar in shape. However, it appeared that in terms of well-being, the healthiest environment was experienced by those who felt that they were members of the scholarly community. It must be noted this result was obtained regardless of the fact that the membership of scholarly community was not always a positive experience. Outsiders experienced receiving the least feedback, whereas an incoherent role was related to worrying and a poor atmosphere. It is not surprising that an incoherent role and identity problems may be related to such ambivalent emotions.

Some methodological reflections

There were some methodological limitations in the present study. Although our quantitative measurements appeared to be quite robust and reliable, they were still rather narrow. The reliabilities of some scales were not optimal. On the other hand, the very idea behind the MED NORD instrument was to minimize the number of questions, which inevitably is a risk considering reliabilities of the scales. Our questionnaire however, still remained quite lengthy and the response rate remained somewhat low. On the other hand it measured a great variety of phenomena. Trying to capture a richer understanding of well-being would have called for an even more demanding measurement, which could have seriously jeopardized the response rate.

To our knowledge, there are few previous studies that have looked at such phenomena in this way. Therefore, a mixed-method approach along with an abductive strategy within opened-ended questions was chosen to explore the phenomena. The approach can be criticized for overlooking the epistemology–method link while combining qualitative and quantitative methods. However, using this approach (Tashakkori & Teddlie, 2003) made it possible to explore the complementary parts of the same phenomenon simultaneously. Moreover, it provided opportunity for triangulation that has been used to improve validity and reliability of findings (Patton, 1990).

Educational and theoretical significance

There appears to be an urgent need for a more efficient means of fostering PhD students' active agency in scholarly communities. The authors suggest forms of instruction that might be helpful include: the research group or a peer group as a supervising resource; recruiting post-doctoral fellows as tutors; and training the supervisors in constructive feedback strategies. These measures could possibly facilitate collaborative practices and prevent prolongation and dropouts from PhD studies.

In the Faculty of Behavioral Sciences, some measures have already been taken, for instance, by implementing supervision agreement, and introducing a new study

program with pedagogical training for both PhD students and their supervisors. Similar interventions on academic writing as in medicine (Lonka, 2003) have been carried out as well. These new actions have been mainly well received. There is still, however, a lot to be done. In particular we suggest that more attention should be paid to developing PhD training as a meaningful entity.

Acknowledgements

Notes on contributors

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