PhD Survey 2021

Experiences of PhD students
at the University of Groningen

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1 Preface

This PhD survey for 2021 is the seventh comprehensive PhD survey at the University of Groningen. PhD surveys have been carried out biennially by the Educational Support and Innovation Centre for Information Technology (ESI-CIT) since 2009, when the Groningen Graduate Schools were founded. All reports are available on our Graduate School webpage.

The University of Groningen is proud that the number of PhD students who successfully defend their thesis has increased by 25% in the last 4 years. This increase is very important because on one hand the Netherlands ranks relatively low among developed countries for what concerns the percentage of the population holding a PhD degree and that has obviously consequences for the innovation potential of the Dutch economy. On the other hand most of the research at Dutch universities is performed by PhD students. Therefore, if our university wants to keep its highly ranked position, it is crucial that our PhD students are doing well and that they are motivated, satisfied with the training they get and the facilities they are offered, appreciative of how they are supervised and enthusiastic about their project. Only if this is the case, they will produce the fantastic science we are all proud of. To ensure successful PhD trajectories, we need to constantly improve and adapt our training and support of doctoral candidates. To this end, it is also important that we get their opinion to verify that we cater adequately to their needs and expectations and this is what this survey aims to achieve. We compared the characteristics of the survey respondents to the actual characteristics of the PhD student population as a whole as evident from our registration system Hora Finita. Similar to previous years respondents are slightly younger and more often female. This year we also see that Dutch PhD students are slightly underrepresented. Although our response sample is not a perfect reflection of our PhD student community, we are confident that this survey gives a fairly good image of PhD student life in our various faculties.

Along with the growth of the PhD student numbers comes also diversification: the University of Groningen currently train young researchers from over 100 countries. While the number of doctoral candidates working on projects for which their supervisor has attracted funding has remained constant over the past years, the number of PhD students with a scholarship from their home countries has increased. Also the percentages of interdisciplinary projects and of projects carried out in co-tutelle with two supervisors at two different institutions, have been on the rise. It is good to see that we apparently manage to cater well to all these doctoral candidates with different backgrounds and needs. Half of our PhD students rate their general satisfaction with their PhD trajectory 8 or higher on a ten-point-scale and the average mark given is 7.3. Also the way of supervising the young researchers changes from the traditional apprentice-master relationship between the PhD student and his/her supervisor to supervision

in teams. Our PhD regulations require two supervisors, but 31% of the respondents indicate that they have three and 10% that they have four supervisors. This supervision in teams seems to work well because we see no change in how the PhD students perceive their supervision over time: also this year the majority were either satisfied (38%) or very satisfied (41%) with the overall supervision they receive. There are however differences over the course of the PhD trajectory as also seen in the previous two surveys: senior PhD students were less satisfied with the supervision they receive than both intermediate and starting PhD students. The satisfaction with the support of their Graduate Schools was the same as 2 years ago.

We saw great changes in aspects influenced by the pandemic. The percentage of PhD students working 'overtime' with respect to their contract hours has increased in 2021 (75%) compared to 2019 (55%) and 2017 (58%), similarly to findings of studies on the effects of Covid-19 on researchers elsewhere. Not only the discussion of ideas and findings with colleagues and peers was greatly hampered by this special situation, almost two-thirds of the PhD students indicated that their data collection was impacted by the pandemic, whereas one third indicated an impact on data analysis and writing. These effects obviously influence how the respondents evaluate their progress: almost half said being delayed, which is twice as many as in 2019. Next to reasons related to the practical circumstances, lack of motivation was twice more frequently mentioned as a reason for delay than two years ago. We hope that the substantial support line set up by the University to help students in working from home and maintaining a good mental condition has had an effect. We might conclude so from the fact that the percentage of PhD students considering quitting has not increased compared to before the pandemic. Also supervisors are supported in their efforts to help their mentees through the newly set up training workshops, for example the one on "How to supervise a stressed PhD student". The new training activities for supervisors, which are currently being set up, will hopefully also have a positive effect on decreasing the workload of PhD students and shorten the delays in finishing the PhD trajectories by equipping the supervisors better for their task of monitoring progress and improve planning.

An important aspect of the PhD trajectory is the educational programme that the doctoral candidates follow next to working on their research project. Following a training programme with a certain number of credits is a mandatory requirement for PhD students with a full or top-up scholarship from UG/UMCG to receive the scholarship. Apart from the courses and workshops traditionally offered by the Graduate Schools to improve the PhD students' professional skills, the PhD Scholarship programme has motivated the University of Groningen to set up the "Career Perspectives Series" aimed at better preparing doctoral candidates for their careers inside and outside academia after defending their thesis. This programme aims at creating awareness for different career options, helping to make choices, setting up a personal development plan, strengthening competencies through courses/workshops, and offering

match making opportunities between the candidates and future employers. Following the success of this "Career Perspectives Series", employee PhD students also asked to participate. However, the survey shows that the percentage of doctoral candidates who profit from this offer is still lower than what we would wish: while nearly 60% are aware that they are offered this opportunity, half of our respondents indicate that they have not actually participated in career orientation activities so far. This motivates us to stimulate our PhD students more to take advantage and to also insist with our supervisors to encourage their mentees participation.

In general this survey has proven again how important the PhD student feedback is for our Graduate School to get indications in how we can improve our PhD training and what points need attention.

To conclude I would like to thank all those who have contributed to the present survey. First the PhD students who took the time to answer the rather extensive list of questions in the survey – I am very grateful that so many of you made that effort. Second, many thanks to Esther Bouma, who improved the survey, performed all the analyses and wrote up the report. The support of ESI student assistants was much appreciated. I would also like to acknowledge the valuable input in discussions by Marjon Fokkens-Bruinsma and Marjan Koopmans, which helped to further improve the survey.

Prof. Petra Rudolf
Dean of the Groningen Graduate Studies

2 Introduction

This PhD report provides an overview of the current state of affairs for PhD students at the University of Groningen (UG). The Board of the University has the aim to prepare PhD graduates in the best possible way for their next career steps as researchers and professionals, both inside and outside academia. The UG aims to have 600 PhD defences each year from 2020. The introduction of the PhD Scholarship Programme at the UG in 2016, in the framework of a national experiment initiated by the Ministry of Education, Culture and Science (OCW), will help to reach these goals, but also presents a number of challenges. It is important to monitor the interplay between policies and actual outcomes in daily practice. Thanks to the PhD registration system Hora Finita, all PhD students in Groningen are clearly registered and easily approachable for the biennial PhD survey, which is an important monitoring tool.

The present PhD survey provides insights into the way PhD students in Groningen experience the organization of their project, their working environment, educational opportunities, supervision and support. By means of an online survey, all PhD students from the UG and UMCG were invited to participate and answer questions about the many aspects of their PhD life. The information gathered in this survey was used for four different goals:

1   To improve PhD programmes at the University of Groningen
2   To gain more insight into doctoral success
3   To evaluate the national PhD Scholarship experiment
4   To gain insight into the experiences of PhD students at the national level

PhD students could indicate whether their answers could specifically be used for each goal.

The 2021 survey is largely similar to those of 2017 and 2019. In view of the final evaluation of the national PhD Scholarship experiment by ResearchNed, additional questions for employed and PhD scholarship students were added. Moreover, two questions examining the effect of the Covid-19 pandemic on PhD student projects and wellbeing were included. Questions regarding housing and support with visa applications were omitted.

Due to the various backgrounds of the PhD students, not every PhD student answered the same questions. For example, questions about the thesis defence were not presented to first year PhD students, while questions about scholarship conditions were not presented to PhD students with an employment contract. Furthermore, PhD students were free to skip questions if they wanted to do so (apart from questions that were necessary to determine different routes through the survey, questions for the national PhD survey project and questions from ResearchNed to evaluate the PhD Scholarship experiment), which means that not all questions were answered by all PhD students.

The results are presented in this report, in which we focus on aspects that are considered the core elements of PhD student policy, while details are provided in Appendices, available online. For several questions, statistical analyses were performed to compare the results between different groups. Detailed information about these statistical tests can be found in the Appendix Table A1.

The outline of the chapters is as follows:
- The present chapter (Chapter 2) provides an introduction to the PhD survey 2021.
- Chapter 3 starts with the response rate and representativeness of the survey sample with respect to the overall UG PhD student population. Subsequently, an overview of the background characteristics of the PhD students who submitted the survey is given.
- Chapter 4 presents some general aspects concerning how the PhD students experience their activities. This chapter deals with the design of the PhD project and level of freedom and workload, as well as overall satisfaction with the PhD trajectory, supervision, teaching and Graduate School. Mental health is also considered in this chapter.
- Chapter 5 concerns the impact of Covid-19 on wellbeing and progress of the project. Planning, delay and doubts about the continuation of the project are also considered in this chapter.
- Chapter 6 gives a detailed description of how PhD students feel in relation to their supervisors and department.
- Chapter 7 deals with the importance of and satisfaction with employment or scholarship conditions.
- Chapter 8 assesses the various ways in which PhD students are monitored and evaluated during their PhD trajectory.
- Chapter 9 describes the accessibility to and satisfaction with courses and other educational activities.
- Chapter 10 describes to what extent PhD students explore their options for a future career and to what extent they feel supported in doing this.
- Chapter 11 presents the conclusions that can be drawn from the UG PhD survey.

3 Sample characteristics

This chapter provides an overview of the characteristics of PhD students who participated in the survey. Firstly, we describe the survey response rate and the nature of the questions. Secondly, the sample's representativeness with respect to the total UG PhD student population is examined for age, gender, nationality and Graduate School. Finally, we discuss the type of affiliation with the UG or UMCG and funding sources.

Response rate

On 3 June 2021, a total of 4,093 PhD students were invited to participate in the survey (all PhD students registered in Hora Finita as 'not finished yet'). After sending two reminders to those who had not completed the survey, it was closed at midnight on 28 June. At that time, 1,128 PhD students had completed a sufficient part of the survey.[1] Of these PhD students, five did not give permission to use their data for Goal (1) of the survey to improve PhD programmes at the University of Groningen. Information about permission for the other three goals can be found in Appendix Table B1. The response rate for the sample used for this report is 27.4%. This is slightly lower than the response rates in previous years (around 30-35%), which might be related to the fact that the survey was distributed in June, a month in which other national (e.g. Covid-19-related) surveys were also distributed.

Sample representativeness

Table 1 presents an overview of the characteristics of the response sample and that of the total invited population (as deduced from the characteristics registered in Hora Finita). It appears that the response sample is marginally younger than the invited population and that women and non-Dutch PhD students are significantly overrepresented in the response sample.

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1 PhD students who completed more than 78% of the survey were included in the 'response sample'. Of the 1458 PhD students who started the survey, 9% stopped after answering 1-25% of the questions, another 12% stopped after answering 26-50% and 2% stopped after answering 51-77% of the questions.

Table 1 Overview of background characteristics in the response sample compared to the UG population

		Response sample		UG population	
		M	Sd	M	Sd
Age (years)		29.5	4.4	31.7	5.8
		%		%	
Gender	Women	57.9		54.5	
	Men	42.1		45.5	
Nationality	Dutch	44.2		50.5	
	Non-Dutch	55.8		49.5	
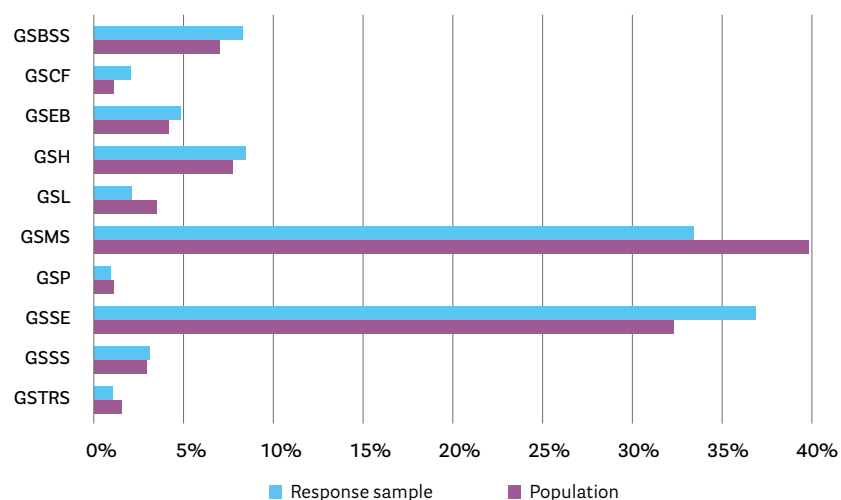
Figure 1 Overview of population and response sample by Graduate School

Acronyms: *GSBSS = Graduate School of Behavioural and Social Sciences, GSCF = Graduate School of Campus Fryslân, GSEB = Graduate School of Economics and Business, GSH = Graduate School of Humanities, GSL = Graduate School of Law, GSMS = Graduate School of Medical Sciences, GSP = Graduate School of Philosophy, GSSE = Graduate School of Science and Engineering, GSSS = Graduate School of Spatial Sciences, GSTRS = Graduate School of Theology and Religious Sciences*

Figure 1 presents the percentages of respondents belonging to each Graduate School and the related percentages in the invited sample (the population). Figure 1 shows that PhD students from the Graduate Schools of Behavioural and Social Sciences and of Science and Engineering are slightly overrepresented, while PhD students from the Graduate Schools of Medical Sciences and Law are slightly underrepresented in the response sample compared to the invited sample. These results are comparable to the previous survey with regard to the response percentages of GBSS, GSSE and GSMS.

Sample characteristics

Phase of the project
Based on their starting date, PhD students were divided into three groups. First-year PhD students ('starters'; 24.4%), second and third-year PhD students ('intermediors'; 44.1%) and fourth-year or beyond ('seniors'; 31.5%). The division of PhD students into these groups is slightly different compared to previous surveys, as slightly fewer starters and slightly more intermediors and seniors took part in the survey.

Educational background
Several questions in the survey considered the PhD students' educational background. The majority of PhD students followed a research or other Master's programme of two years (58.1%), while 13.1% obtained a degree from a one-year programme and 25.9% from a programme of more than two years duration. Almost one quarter (24.7%) indicated that the final year of their Master's could be regarded as part of their PhD project. More than one third (37.1%) obtained their Master's degree at the University of Groningen.

Table 2 Overview of ISCED category

ISCED category	N	%
1 Education	26	2.3
2 Arts and humanities	107	9.5
3 Social sciences, journalism and information	97	8.6
4 Business, administration and law	21	1.9
5 Natural sciences, mathematics and statistics	268	23.9
7 Engineering, manufacturing and construction	148	13.2
9 Health and welfare	373	33.2
Missing/undefined	83	7.4
Total	1123	100.0

Research area

The research institutes of the UG were recoded to ISCED (International Standard Classification of Education) categories. Category 6 (Information and communication technologies) and Category 8 (Agriculture, forestry, fisheries and veterinary) are not present at the UG. The majority of PhD students perform research in Health and Welfare (33%) and Natural Sciences, Mathematics and Statistics (24%), as presented in Table 2.

PhD student characteristics per Graduate School

Table 3 presents the number of PhD students and their characteristics per Graduate School. Some inconsistencies were found between the Graduate Schools as indicated by the PhD students and the Graduate School affiliation shown in Hora Finita (2.5% indicated a different Graduate School, while 2.2% did not know to which Graduate School they belonged; mainly PhD students from GSSE and GSMS). The Graduate Schools as indicated in Hora Finita were used in the analyses, as in previous years.

Table 3 PhD student characteristics by Graduate School

Acronyms	Graduate School	N	% of total	% Female	% Dutch	% Starters	Mean age
GSBSS	Behavioural and Social Sciences	92	8.2	69.6	65.2	21.7	29.9
GSCF	Campus Fryslân	21	1.9	61.9	52.4	28.6	30.1
GSEB	Economics and Business (SOM)	53	4.7	58.5	46.2	26.4	29.1
GSH	Humanities	94	8.4	69.1	46.8	27.7	31.3
GSL	Law	23	2.0	43.5	43.5	30.4	30.6
GSMS	Medical Sciences	375	33.4	70.1	59.4	18.4	29.7
GSP	Philosophy	7	0.6	71.4	66.7	0.0	28.4
GSSE	Science and Engineering	414	36.9	42.5	24.8	30.7	28.8
GSSS	Spatial Sciences	34	3.0	52.9	30.3	29.4	30.3
GSTRS	Theology and Religious Studies	10	0.9	50.0	55.6	10.0	33.3
	Total	1123	100.0				

Comparable to previous surveys, most PhD students are part of either the Graduate School of Medical Sciences or the Graduate School of Science and Engineering. The Graduate School of Theology has on average the oldest PhD students, while the Graduate School of Science and Engineering has the lowest percentage of female PhD students.

Type of relationship with the University of Groningen

PhD students were asked to indicate how they are affiliated to the UG (or UMCG). For this survey, a decision tree was constructed that aimed to capture the six types of PhD students as formulated by the VSNU (Vereniging van Samenwerkende Nederlandse Universiteiten):

1a. Employed PhD student *('werknemer-promovendus')*. These PhD students have a temporary PhD employment contract (usually four years full time or five years part-time) with the UG/UMCG.

1b. Employee in a PhD track *('promoverend medewerker')*. An UG/UMCG employee with a contract (often physician, research assistant or lecturer), who is allowed to work some allocated time on their PhD research.

2a. PhD student on a scholarship from UG/UMCG *('beurspromovendus UG/UMCG')*. Not employed but financed by a scholarship from UG/UMCG. Most of these are PhD scholarship students ('promotiestudenten') in the national PhD Scholarship experiment.

2b. PhD student on a scholarship from another institution *('beurspromovendus andere beursverstrekker')*. Not employed but financed by a primary scholarship from a provider other than UG/UMCG (usually from their home country). Most of these PhD students receive a top-up scholarship from UG/UMCG and have the same conditions as PhD scholarship students with a full scholarship from UG/UMCG (2a).

3. Externally financed PhD student *('extern gefinancierde promovendus')*. These PhD students are employed by an institute/organization other than UG/UMCG. The research is sometimes partly done at that institution.

4. External PhD student *('buitenpromovendus met eigen middelen')*. These PhD students do not receive any financial compensation for their research work.

Consequences of misinterpretations of the affiliation questions

Although the design of the questions in and routing through the decision tree was thoroughly thought through and discussed with colleagues and PhD students from several universities, 31% of the PhD students misinterpreted one or more of the affiliation questions (see Appendix M). This resulted in discrepancies between the survey data and Hora Finita (presented in Table 4). Discrepancies were checked by the coordinator of the Graduate Schools and it was concluded that for more than 98% the registration in Hora Finita was correct. For this reason, information from Hora Finita (and not the survey answers) was used to compare the answers of different PhD student types. While presenting the results, data might be missing due the above-mentioned discrepancies between Hora Finita and the survey.

For three PhD students, the affiliation in Hora Finita was missing; for these PhD students the affiliation recorded in the survey was used (see Table 4).

PhD students of type 2a, 2b and 3, especially, selected answers that led them to end up in Group 1a. As a consequence, some PhD students were presented with questions that were not applicable to their situation, while other PhD students were not presented with the questions relevant to them.

Table 4   Discrepancies in affiliation status between Hora Finita and survey results

VSNU PhD student type	Source			
	Hora Finita		Survey	
	N	%	N	%
1a. Employed PhD student	496	44.3	623	55.5
1b. Employee in PhD track	24	2.1	70	6.2
2a. PhD student on scholarship from UG/UMCG	243	21.7	163	14.5
2b. PhD student on scholarship from other institution (and top-up from UG/UMCG)	203	18.1	134	11.9
3. Externally financed PhD student	81	7.2	43	3.8
4. External PhD student	73	6.5	90	8.0
Total	1120	100.0	1123	100.0

Chapter conclusion

From the results described in this chapter, we conclude that the response sample is more or less representative for the UG PhD student population. In the remainder of this report, we will therefore refer to the response sample as 'PhD students'. In the following chapters, the answers to questions will be presented for the entire sample and, if appropriate, for different groups of PhD students. The minimum number of respondents in a group was set at N = 15 in order to have sufficient weight and to ensure anonymity.

4 Overarching aspects of the PhD trajectory

This chapter discusses overarching aspects of the PhD trajectory. It starts with overall satisfaction with the PhD project, design of the project and amount of freedom within the project. Mental health of the PhD students is also examined. Subsequently, the composition of and satisfaction with the supervision team are presented, followed by familiarity and satisfaction with the Graduate School. PhD student participation in teaching and supervising activities is considered and the discrepancy between official and actual work hours as well as the work load are examined.

Overall satisfaction with PhD trajectory

At the start of the survey, PhD students were asked to indicate their general satisfaction with their PhD trajectory on a ten-point scale ('Overall, how satisfied are you with your PhD trajectory on a scale of 1 [very dissatisfied] to 10 [very satisfied]?'). An average score of 7.3 (Sd = 1.5) was found. An overview of the response categories is presented in Figure 2. In 2019, overall satisfaction was measured on a five-point scale (average score 3.6, Sd = 0.9), in line with the national PhD project; this year a ten-point scale was used.
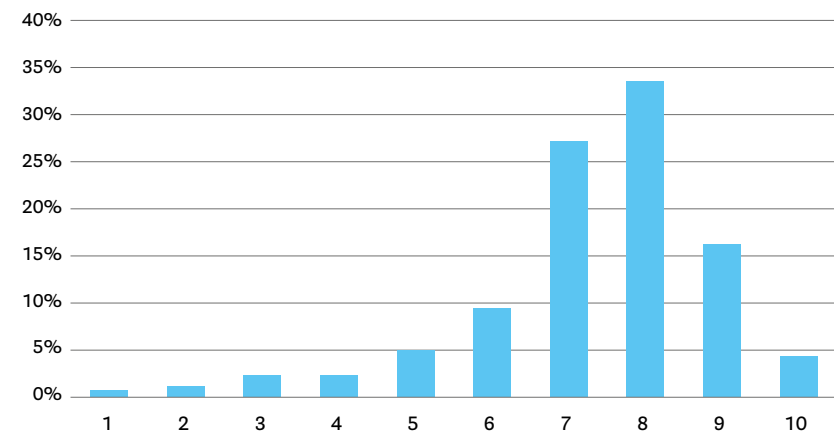
Figure 2   Overall, how satisfied are you with your PhD trajectory on a scale of 1 (very dissatisfied) to 10 (very satisfied)?

Group differences
First-year PhD students (M = 7.8, Sd = 1.4) were significantly more satisfied than intermediors (M = 7.2, Sd = 1.4) and seniors (M = 7.0, Sd = 1.6). PhD student nationals from an EER country other than the Netherlands were significantly less satisfied (M = 7.1, Sd = 1.9) than PhD students with a non-EER nationality (M = 7.4, Sd = 1.7) or PhD students with Dutch nationality (M = 7.3, Sd = 1.2). Externally financed PhD students and external PhD students were most satisfied (M = 7.6 and 7.5, resp.), while employees in a PhD track and PhD students on a UG/UMCG scholarship were the least satisfied (M = 7.1; see Table 5). These differences are not statistically different.

Table 5   Average satisfaction with PhD trajectory per PhD student type

VSNU-PhD student type	N	Mean	Sd
1a. Employed PhD student	496	7.3	1.4
1b. Employee in PhD track	24	7.1	1.7
2a. PhD student on UG/UMCG scholarship	243	7.1	1.5
2b. PhD student on other scholarship	203	7.4	1.7
3. Externally financed PhD student	81	7.6	1.3
4. External PhD student	73	7.5	1.7

The differences per Graduate School are presented in Table 6. PhD students from the Graduate School of Humanities and the Graduate School of Spatial Sciences were most satisfied (M = 7.6) while those of the Graduate Schools of Campus Fryslân (M = 6.8) are the least. These differences are not statistically significant.

Table 6   Average satisfaction with PhD trajectory per Graduate School

Graduate School	N	Mean	Sd
Behavioural and Social Sciences	92	7.2	1.7
Campus Fryslân	21	6.8	1.6
Economics and Business (SOM)	53	7.1	1.5
Humanities	94	7.6	1.4
Law	23	7.5	2.0
Medical Sciences	375	7.4	1.3
Philosophy*	7	7.5	0.8
Science and Engineering	414	7.2	1.7
Spatial Sciences	34	7.6	1.3
Theology and Religious Studies*	10	7.1	1.0

* GSP and GSTRS were not include in the statistical tests.

Design of the project

PhD students were asked to indicate who designed their project. As presented in Table 7, 34% of the PhD students indicated that they co-designed the project, 36% answered that their supervisor(s) designed the entire or most of the project and 19% indicated that the project was mostly designed by themselves with help from their supervisor(s). These percentages are comparable to the survey of 2019.

Table 7   Who designed your PhD project at the beginning of your trajectory?

Answer	N	%
1. My supervisor(s) designed the entire project	163	14.5
2. My supervisor(s) designed most of the project; my contribution was modest	255	22.7
3. My supervisor(s) and I co-designed the project	385	34.3
4. I designed most of the project; my supervisor's/supervisors' contribution was modest	215	19.1
5. I designed the entire project	65	5.8
6. My project was designed by a national or international consortium	33	2.9
7. Other	7	0.6
Total	1123	100.0

Group differences
Participation in the design of the project differs among PhD student types (see Table 8). For almost one quarter (24%) of the employed PhD students (type 1a), the supervisor designed the project. Co-design was the most commonly chosen option for employees in a PhD track (type 1b; 38%), PhD students on a UG/UMCG scholarship (type 2a; 40%), PhD students on another scholarship (type 2b; 45%) and external PhD students (type 4, 40%). These percentages show that scholarship PhD students (types 2a and 2b) contribute more to the design of their project than employed PhD students, which is a reflection of one of the objectives of the PhD Scholarship Programme of the UG. The percentages are comparable to those of the previous survey.

Table 8 Percentages 'Who designed the project' by PhD student type

Answer	1a %	1b %	2a %	2b %	3 %	4 %
1. My supervisor(s) designed the entire project	**23.6**	8.3	5.8	8.9	12.3	1.4
2. My supervisor(s) designed most of the project; my contribution was modest	**26.6**	**33.3**	**20.2**	**21.2**	**23.5**	5.5
3. My supervisor(s) and I co-designed the project	**26.4**	**37.5**	**39.5**	**45.3**	**33.3**	**39.7**
4. I designed most of the project; my supervisor's/supervisors' contribution was modest	13.1	16.7	**25.1**	**19.7**	**24.7**	**34.2**
5. I designed the entire project	3.4	0	9.5	3.4	4.9	19.2
6. My project was designed by a national or international consortium	5.8	4.2	0	1	1.2	0
7. Other	1.0	0	0	0.5	0	0

Abbreviations: *1a = employed PhD student, 1b = employee in PhD track, 2a = PhD student on UG/UMCG scholarship, 2b = PhD student on other scholarship, 3 = externally funded PhD student, 4 = external PhD student*
Note: *Blue indicates percentages > 20%*

Differences were also present with regard to Graduate School. For all Graduate Schools, the answer options 3 and 4 were most prevalent, except for the Graduate School of Medical Sciences and the Graduate School of Science and Engineering; PhD students from these Graduate Schools have less influence on the design of their project (see Table 9). A relative high proportion of PhD students from the Graduate School of Humanities indicated that they designed their project themselves (28%).

Level of freedom

PhD students were asked to indicate their level of freedom in their PhD project by means of six statements, rated on a five-point scale. On average, PhD students agreed most with the statement, 'I have the freedom to choose which courses to take', and least with the statement, 'I have the freedom to choose which journals to publish in'. The results for the other statements are presented in Table 10.

Table 9 Percentages 'Who designed the project' by Graduate School

Answer	GSBSS %	GSFC %	GSEB %	GSH %	GSL %	GSMS %	GSSE %	GSSS %
1. My supervisor(s) designed the entire project	12	0	3.8	2.1	0	14.1	**22.2**	8.8
2. My supervisor(s) designed most of the project; my contribution was modest	14.1	9.5	7.5	7.4	4.3	**29.1**	**27.8**	8.8
3. My supervisor(s) and I co-designed the project	**39.1**	**33.3**	**43.4**	**28.7**	**30.4**	**39.2**	**30.2**	**35.3**
4. I designed most of the project; my supervisor's/supervisors' contribution was modest	**27.2**	**52.4**	**34**	**33**	**47.8**	**13.6**	12.8	**23.5**
5. I designed the entire project	5.4	4.8	5.7	**27.7**	13	1.1	2.4	17.6
6. My project was designed by a national or international consortium	1.1	0	5.7	1.1	4.3	2.4	3.9	5.9
7. Other	1.1	0	0	0	0	0	0.7	0

Acronyms: *GSBSS = Graduate School of Behavioural and Social Sciences, GSCF = Graduate School of Campus Fryslân, GSEB = Graduate School of Economics and Business, GSH = Graduate School of Humanities, GSL = Graduate School of Law, GSMS = Graduate School of Medical Sciences, GSSE = Graduate School of Science and Engineering, GSSS = Graduate School of Spatial Sciences.*
Note: *Blue indicates percentages > 20%.*

Table 10 Perceived level of freedom

Statement	N	M	Sd
1. In my PhD project there is much room for my own ideas.	1118	4.2	0.9
2. I have the freedom to make my own choices about the direction of my project and the methods to be used.	1119	4.0	0.9
3. I have the freedom to choose which conferences to attend.	1093	4.1	0.9
4. I have the freedom to choose which courses to take.	1102	4.3	0.8
5. I have the freedom to choose which journals to publish in.	1005	3.7	1.0
6. I have the freedom to choose when and where I work.	1115	4.1	1.0
Freedom scale (α = 0.83)	1122	4.1	0.7

Group differences
Externally funded and external PhD students experience significantly more freedom than employed (1a and 1b) and PhD students on a scholarship (2a and 2b), as shown in Table 11.

Table 11 Perceived level of freedom by PhD student type

VSNU PhD student type	N	Mean
1a. Employed PhD	4.0	0.6
1b. Employee in PhD track	4.1	0.8
2a. PhD student on UG/UMCG scholarship	4.0	0.7
2b. PhD student on other scholarship	4.1	0.6
3. Externally funded PhD student	4.3	0.6
4. External PhD student	4.3	0.7

Differences were also significant between the three phases; starting PhD students reported the highest level of freedom (M = 4.2, Sd = 0.6), followed by intermediors (M = 4.1, Sd = 0.7) and then seniors (M = 4.0, Sd = 0.7).

Finally, differences were present between the Graduate Schools. As shown in Table 12, PhD students from the Graduate Schools of Law and Philosophy perceived the highest levels of freedom, while the PhD students in the Medical Sciences, Behavioural and Social Sciences and Science and Engineering perceived the lowest level of freedom. Average scores for GSL and GSH are significantly higher than average scores for GSBSS, GSSE and GSMS. These results are comparable to 2019.

Table 12 Perceived level of freedom by Graduate School

Graduate School	N	Mean	Sd
Behavioural and Social Sciences	92	4.0	0.7
Campus Fryslân	21	4.1	0.6
Economics and Business (SOM)	53	4.2	0.6
Humanities	94	4.4	0.6
Law	23	4.5	0.6
Medical Sciences	375	4.0	0.7
Philosophy*	7	4.7	0.6
Science and Engineering	413	4.0	0.7
Spatial Sciences	34	4.3	0.7
Theology and Religious Studies*	10	4.3	0.7

* GSTRS and GSP were not included in statistical tests.

Mental health

PhD students were asked to rate their general mental health and the impact of their PhD project on their mental health. As indicated in Table 13, 15% rated their mental health as poor to very poor, 32% as fair, 38% as good and 15% as very good. A little over one quarter (27%) indicated that their PhD project had a fairly positive to positive impact on their mental health, while 34% stated that their PhD project had a (rather) negative impact. About one third (35%) answered neutral (see Table 14).

Table 13 How would you rate your general mental health?

Answer	N	%
1. Very poor	22	2.0
2. Poor	146	12.9
3. Fair	355	31.6
4. Good	424	37.8
5. Very good	167	14.9
6. I don't know	9	0.8
Total	1123	100.0

Table 14 In general, what impact does your PhD project have on your mental health?

Answer	N	%
1. Positive	77	6.9
2. Fairly positive	226	20.1
3. Neutral	394	35.1
4. Rather negative	288	25.6
5. Negative	105	9.3
6. I don't know/I don't want to answer	33	2.9
Total	1123	100.0

Group differences
Differences were examined for phase, nationality and PhD student type. Although there was no difference regarding mental health ratings between PhD students in the different phases, a significant difference was present for the impact of the project on PhD students' mental health. PhD students in their last year report a higher (rather) negative impact (47%) than starters (22%) and intermediors (34%).

With regard to nationality, the percentage of PhD students from outside the Netherlands who rated their mental health as poor to very poor was higher (EER: 23%, non-EER: 20%) than it was for Dutch PhD students (8%). A negative or rather negative impact of the PhD project on mental health was more often indicated by PhD students with an EER nationality (50%) compared to those with Dutch (31%) or a non-EER nationality (31%).

Mental health scores also differed according to PhD student type. The percentages are shown in Table 15. The highest proportions of both poor to very poor and a good to very good mental health were found in group 1b (employees in PhD track). External PhD students (group 3) and externally funded PhD students (group 4) experience the best mental health, followed by employed PhD students (group 1a). Over 20% of PhD students with an external scholarship (group 2b) reported experiencing poor to very poor mental health. This might in part be explained by nationality and the fact that they are far from home.

Table 15   Mental health scores by PhD student type

VSNU PhD student type	% Poor to very poor	% Fair	% Good to very good
1a. Employed PhD	14.8	30.8	54.4
1b. Employee in PhD track	29.2	0	70.8
2a. PhD student on UG/UMCG scholarship	15.0	37.3	47.7
2b. PhD student on other scholarship	21.2	34.2	44.6
3. Externally funded PhD student	8.6	27.2	64.2
4. External PhD student	11.1	22.2	66.7

Supervision

Composition of supervision team

The PhD regulations of the University of Groningen stipulate that PhD students must be supervised by more than one supervisor. In 2021, 4% of the PhD students indicated that they only had one supervisor; this proportion was considerably higher in 2019, namely 18%. Almost half (49%) of the PhD students indicated having two supervisors, 31% have three, 10% have four and 5% have more than four. A large majority (96%) know which of their supervisors is their official promotor. The average number of supervisors for each Graduate School is indicated in Table 16.

Table 16   Average number of supervisors by Graduate School as perceived by respondents

Graduate School	N	Mean	Sd
Behavioural and Social Sciences	90	2.7	0.7
Campus Fryslân	21	2.5	0.8
Economics and Business (SOM)	51	2.4	0.6
Humanities	93	2.5	0.7
Law	23	2.3	0.5
Medical Sciences	371	2.9	0.9
Philosophy*	7	2.7	0.8
Science and Engineering	393	2.5	1.0
Spatial Sciences	34	2.5	0.6
Theology and Religious Studies*	9	1.9	0.3

* GSTRS and GSP were not included in statistical tests.

Group differences

At the Graduate Schools of Humanities (1%), Economics and Business and Medical Sciences (both 2%) proportions of PhD students with only one supervisor are small. Similar to 2019, a relatively large proportion (10%) of PhD students from the Graduate School of Science and Engineering claim that they have only one supervisor. For the Graduate School of Theology and Religious Studies, this proportion is also high (11%). With regard to PhD student type, no significant difference was found for having either one or more than one supervisor.

Overall satisfaction with supervision

The majority of the PhD students were either satisfied (38%) or very satisfied (41%) with the overall supervision they receive. An average score of 4.1 (Sd = 1.0) was given on a five-point scale, which is similar to 2019 and 2017.

Group differences

As in 2019 and 2017, senior PhD students (M = 3.9) were significantly less satisfied with the supervision they receive than both intermediate PhD students (M = 4.1) and starting PhD students (M = 4.3). External PhD students were most satisfied with their supervision, while employees in a PhD track were the least satisfied. See Table 17 for an overview of the average satisfaction with supervision for each PhD student type. The difference between the highest and lowest scoring group was statistically significant. No differences were present between Graduate Schools or nationality groups.

Table 17   Average satisfaction with supervision by PhD student type

VSNU PhD student type	N	Mean	Sd
1a. Employed PhD student	496	4.1	1.1
1b. Employee in PhD track	247	3.8	1.2
2a. PhD student on scholarship from UG/UMCG	243	4.1	1.1
2b. PhD student on another scholarship	203	4.0	1.0
3. Externally financed PhD student	81	4.2	1.0
4. External PhD student	73	4.4	1.1

Graduate School

This section concerns two aspects of the Graduate School. First PhD students were asked to state in which ways their Graduate Schools supports them. Secondly, they were asked to rate how satisfied they were with these services.

Table 18   How is your Graduate School supporting you during your PhD trajectory? (multiple answers allowed)

Answer	N	%
1. Offering courses, symposia, workshops, etc.	761	65.7
2. Providing information	738	67.8
3. Keeping track of my progress	359	32.0
4. Supporting me in the case of problems (e.g. with my progress, supervisor, funding)	389	34.6
5. Other	12	1.1
6. I don't know	178	15.9
Number of PhD students who selected at least one option	944	

Support by Graduate School

PhD students were asked to indicate how their Graduate School supports them during their PhD trajectory. PhD students were allowed to indicate multiple answers. A total number of 944 PhD students (84% of the sample) selected one or more aspects in which they felt supported by their Graduate School (see Table 18). Results are comparable to those of 2019.

Group differences

The way PhD students feel supported by their Graduate School is further detailed to the level of the various Graduate Schools (the category 'Not applicable' was excluded), see Table 19. It is apparent that the PhD students of some Graduate Schools mainly feel supported by the provision of information or by the availability of courses, symposia and workshops. This is the case for GSBSS, GSCF, GSH, GSMS and GSSE. A relative high proportion of PhD students from GSEB and GSSS also reported that their Graduate School keeps track of their progress. These differences between Graduate Schools are similar to those of 2019. In addition, over 60% of the PhD students from GSEB, GSSS and GSL reported support from their Graduate School in the case of problems.

Table 19   How is your Graduate School supporting you during your PhD trajectory?

Answer	GSBSS %	GSFC %	GSEB %	GSH %	GSL %	GSMS %	GSSE %	GSSS %
1. Offering courses, symposia, workshops, etc.	71.7	76.2	77.4	75.5	87.0	70.1	60.4	67.6
2. Providing information	56.5	85.7	75.5	71.3	87.0	65.3	61.4	82.4
3. Keeping track of my progress	12.0	28.6	64.2	27.7	43.5	31.2	30.2	64.7
4. Supporting me in case of problems	14.1	33.3	64.2	34.0	69.6	28.0	36.2	64.7

Acronyms: *GSBSS = Graduate School of Behavioural and Social Sciences, GSCF = Graduate School of Campus Fryslân, GSEB = Graduate School of Economics and Business, GSH = Graduate School of Humanities, GSL = Graduate School of Law, GSMS = Graduate School of Medical Sciences, GSSE = Graduate School of Science and Engineering, GSSS = Graduate School of Spatial Sciences*

Satisfaction with the Graduate School

PhD students indicated how satisfied they were with different aspects of their Graduate School by scoring seven statements on a five-point scale (from completely disagree [1] to completely agree [5]). On average, a mean scale score of 3.4 (Sd = 0.7, α = 0.91) was found, indicating that the PhD students are mildly positive regarding their overall satisfaction with the services of their Graduate School. Table 20 shows the average agreement for each of the seven propositions.

Table 20 **Agreement scores with propositions regarding satisfaction with their Graduate School**

Statement	N	M	Sd
1. I know whom I can turn to in my Graduate School when I encounter problems in general (e.g. with my supervision or training).	1075	3.5	1.0
2. I am satisfied with the educational activities provided by my Graduate School.	1066	3.5	0.9
3. I am satisfied with the way in which my Graduate School monitors and supports the supervision of my PhD project.	1037	3.2	0.9
4. I am satisfied with the way in which my Graduate School monitors the progress of my PhD project.	1044	3.2	0.9
5. My Graduate School provides a stimulating study and research environment that facilitates interaction and efficiency.	1033	3.3	0.9
6. My Graduate School provides me with adequate information (e.g. emails, website, PhD guide).	1071	3.6	0.9
7. Overall, I am satisfied with the way in which my Graduate School functions.	1077	3.5	0.8

Group differences

Significant differences in the 'Graduate School satisfaction' scale score were found between the Graduate Schools. This year GSCF had the lowest score (M = 2.8) and GSL the highest score (M = 4.0). The second lowest scale score was for GSBSS (M = 3.1), although the score increased compared to 2019 (M = 2.9). Figure 3 shows average scale scores for Graduate Schools with at least 15 respondents. The average score for GSL is significantly higher than for GSCF, GSBSS and GSMS and the score for GSCF is significantly lower than for GSEB, GSH, GSL, GSSE and GSSS. In addition, the scores for GSBSS are significantly lower than for GSEB and GSL.
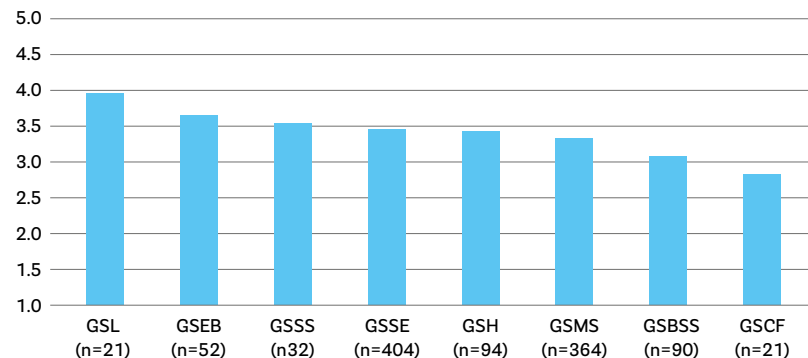
Figure 3 **Average scale score 'Graduate School satisfaction', by Graduate School**

Table 21 presents the results for the seven items. Significant differences were found for all items. Generally, GSCF, GSBSS and GSMS had scores close to 3, while GSL, GSEB and GSSS had scores close to 4. When the difference between the highest score (indicated in green) and the lowest score (indicated in red) is more than 0.4, the difference can be considered statistically significant. GSH and GSSE had average scores between 3 and 4 and do not statistically differ from one another or from the highest and lowest scoring Graduate Schools. GSP and GSTRS scored high on some items but due to the low number of respondents (< 15) they were not included in the statistical test.

Table 21 **Mean scores for items regarding satisfaction with the Graduate School by Graduate School**

	1. I know whom I can turn to in my GS when I encounter problems in general			2. I am satisfied with the educational activities provided by my GS		
	N	M	Sd	N	M	Sd
GSBSS	88	3.2	1.1	86	3.3	0.9
GSCF	21	4.0	0.7	21	2.9	1.2
GSEB	52	4.2	0.8	52	3.7	0.9
GSH	93	3.7	1.0	91	3.5	0.8
GSL	20	4.3	0.9	19	4.1	0.9
GSMS	357	3.2	1.0	357	3.5	0.8
GSP*	7	3.7	0.8	7	3.1	0.9
GSSE	396	3.4	1.0	392	3.6	0.8
GSSS	32	4.2	0.7	32	3.5	0.9
GSTRS*	9	4.2	1.1	9	3.8	0.7

Acronyms figure 3 and table 21: *GSBSS = Graduate School of Behavioural and Social Sciences, GSCF = Graduate School of Campus Fryslân, GSEB = Graduate School of Economics and Business, GSH = Graduate School of Humanities, GSL = Graduate School of Law, GSMS = Graduate School of Medical Sciences, GSSE = Graduate School of Science and Engineering, GSSS = Graduate School of Spatial Sciences*
Note: *Green indicates the highest scale score in a group, red indicates the lowest score in the case of the maximum difference being statistically significant.*
* GSP and GSTRS were not included in the statistical tests.

	3. I am satisfied with the way in which my GS monitors and supports the supervision of my PhD project			4. I am satisfied with the way in which my GS monitors the progress of my PhD project		
	N	M	Sd	N	M	Sd
GSBSS	80	2.8	0.9	80	2.8	0.9
GSCF	21	2.5	1.0	21	2.3	0.9
GSEB	52	3.4	1.1	52	3.5	0.9
GSH	87	3.1	0.9	86	3.2	0.9
GSL	20	3.8	1.0	20	3.7	1.0
GSMS	350	3.2	0.9	354	3.2	0.9
GSP*	6	3.7	0.8	6	3.7	0.8
GSSE	381	3.4	0.9	384	3.3	0.9
GSSS	32	3.3	1.0	32	3.3	1.0
GSTRS*	8	3.4	0.7	9	3.7	0.5
	5. My GS provides a stimulating study and research environment that facilitates interaction and efficiency			6. My GS provides me with adequate information		
GSBSS	83	3.0	0.9	87	3.2	1.0
GSCF	21	2.4	1.0	21	3.1	0.9
GSEB	50	3.3	1.1	52	3.9	0.8
GSH	90	3.2	1.0	93	3.8	0.9
GSL	21	3.5	1.1	21	4.2	0.8
GSMS	344	3.3	0.9	356	3.6	0.8
GSP*	6	3.7	0.5	7	3.9	0.7
GSSE	377	3.4	0.9	393	3.7	0.8
GSSS	32	3.2	1.0	32	3.8	0.8
GSTRS*	9	4.0	0.5	9	4.0	0.7
	7. Overall, I am satisfied with the way in which my GS functions			8. Satisfaction scale score (α = 0.91)		
GSBSS	88	3.2	0.9	90	3.1	0.8
GSCF	21	2.7	0.8	21	2.8	0.7
GSEB	52	3.7	0.9	52	3.7	0.7
GSH	92	3.5	0.8	94	3.4	0.7
GSL	21	4.1	1.0	21	4.0	0.8
GSMS	359	3.5	0.8	364	3.3	0.7
GSP*	7	3.6	0.5	7	3.6	0.6
GSSE	396	3.6	0.8	404	3.5	0.7
GSSS	32	3.6	0.9	32	3.6	0.7
GSTRS*	9	4.1	0.3	9	3.9	0.4

Supervising/teaching students

PhD students were asked if they teach or supervise Bachelor's and/or Master's students (or are planning to do so). Table 22 presents the percentages for each answer category.

Table 22   Do you teach and/or supervise students (or are you planning to do so)?

Answer	N	%
1. Yes, it is part of my contract/agreement	287	29.0
2. Yes, but it is not part of my contract/agreement	390	39.4
3. No, I am not allowed to teach/supervise	92	9.3
4. No, I am allowed to teach/supervise but I don't	115	11.6
5. Yes, as part of my training programme (in combination with the 'Start to Teach' training)	60	6.1
6. Other	45	4.6
Total	990	100.0

Note: *Of the 45 PhD students who chose 'Other', 10 PhD students said 'I don't know' and 13 PhD students indicated that they teach but not at the UG/UMCG.*

Table 23   Involvement in teaching/supervising by PhD student type

VSNU PhD student type	N	%
1a. Employed PhD student	429	88.4
1b. Employee in PhD track	18	78.2
2a. PhD student on UG/UMCG scholarship	163	71.1
2b. PhD student on other scholarship	90	47.9
3. Externally funded PhD student	37	78.8
4. External PhD student	11	73.4

Involvement in teaching differs between PhD types: employed PhD students (type 1a) are most often involved in teaching/supervising (88%), while PhD students on other types of scholarships (type 2b) than UG/UMCG scholarships   are the least involved in these activities (48%). In the other four PhD types, around three quarters are involved in teaching/supervising (see Table 23). The percentage of teaching in external PhD students (type 4) is relatively high (73%); they are either highly involved in teaching or some might have misunderstood the question. Table 24 shows the involvement for the largest Graduate Schools. PhD students from the GSBSS, GSL, GSMS and GSSE are most involved in teaching (at least 75%).

Table 24   **Involvement in teaching/supervising by Graduate School**

Graduate School	N	% teaching
Graduate School of Behavioural and Social Sciences	61	80.3
Graduate School of Campus Fryslân	14	73.7
Graduate School of Economics and Business	29	60.4
Graduate School of Humanities	48	66.7
Graduate School of Law	14	87.5
Graduate School of Medical Sciences	259	76.6
Graduate School of Science and Engineering	299	79.7
Graduate School of Spatial Sciences	19	61.3

Obligatory or voluntary teaching/supervising

For each of the PhD student types involved in teaching/supervising, Table 25 displays whether this is obligatory (part of their contract), a voluntary part of their training programme (but not part of their contract) or voluntary (not part of their contract). PhD students on scholarships (2a and 2b) can not be asked to teach but they can choose to teach as part of their training programme. Over half (59%) of the employed PhD students (1a), one-third (33%) of employees in a PhD track (1b) and one fifth (27%) of externally funded PhD students state that for them teaching/supervising is obligatory.

Table 25   **Obligatory or voluntary teaching, by PhD student type**

VSNU PhD student type	N	Obliged by contract	Part of training programme	Voluntary
1a. Employed PhD student	429	58.5	4.9	36.6
1b. Employee in PhD track	18	33.3	5.6	61.1
2a. PhD student on UG/UMCG scholarship	163	3.7	16.6	79.8
2b. PhD student on other scholarship	90	12.2	8.9	78.9
3. Externally funded PhD student	37	27.0	8.1	64.9
4. External PhD student	11	9.1	0.0	90.9

Training how to teach/supervise

PhD students were asked if they received sufficient training in how to teach or supervise students. Over two thirds of the PhD students (66%) indicated that they feel they did not receive sufficient training. The percentage of PhD students who felt unprepared is slowly increasing, from 58% in 2017 to 66% in 2019 and 2021.

Group differences

Receiving sufficient training differed significantly among PhD student types. Table 26 shows the number of PhD students who answered the question 'Do you (or did you) receive sufficient training in how to teach and supervise students?', followed by the percentage of PhD students who do not feel sufficiently prepared. About 40% of the PhD students with a UG/UMCG scholarship (2a) and 60% of employed PhD students (1a) indicated that they felt they had not received sufficient training to teach and supervise.

Table 26 also shows the percentage of PhD students who attended at least one educational activity regarding teaching. For all types (except 1a and 2a), less than one third attended a course on teaching. Of the two types who teach most (1a and 2a), PhD scholarship students (2a) indicated the highest proportion of attendance (35%). For PhD scholarship students (2a), teaching training is obligatory if they want to teach or supervise. Employed PhD students can follow the same training programme but often do not, as indicated by these results.

Table 26   **Overview of feeling sufficiently prepared for teaching and the accessibility and attendance of teaching training activities, by PhD student type**

	Sufficiently prepared		Attendance of at least one activity	
VSNU PhD student type	N	% no	N	% yes
1a. Employed PhD student	423	59.1	496	30.2
1b. Employee in PhD track	18	37.5	24	12.5
2a. PhD student on UG/UMCG scholarship	160	40.7	243	34.6
2b. PhD student on other scholarship	90	27.6	203	22.7
3. Externally funded PhD student	33	24.7	81	27.2
4. External PhD student	9	11	73	15.1

Type of teaching activities

The PhD students who did indicate they were involved in teaching (N = 737) were asked about the types of teaching activities they participated in. They could choose multiple answers, and a total of 1355 answers were given by 737 PhD students. Table 27 shows that 76% of PhD students supervised individual students, while around 40% gave workshops, seminars or practicals. These percentages are comparable to 2019.

Table 27 **What kind of teaching activities do you do or have you done during your PhD trajectory? (multiple answers allowed)**

Answer	N	%
1. Giving lectures	197	26.7
2. Giving workshops/seminars/practicals	314	42.6
3. Supervising groups of students	259	35.1
4. Supervising individual students	561	76.1
No teaching activities yet	23	3.1
Other teaching tasks	1	0.1
Number of PhD students who selected at least one option	737	

Time spent on teaching

PhD students were asked how many hours per week they spend, on average, on teaching and on supervising students (36 hours is considered a normal working week). On average, PhD students spent 5.2 hours per week on teaching; however, large differences were present, as the standard deviation was 5.6 hours. Fewer hours were spent on supervising Bachelor's and Master's students, namely 4.5 hours on average but again with large differences (Sd = 5.6 hours). Comparisons with 2019 cannot be made due to the different way the question about time investment was posed.

Balance between teaching and other work

Finally, PhD students involved in teaching were asked 'How do you feel about the balance between teaching/supervising and other work in your PhD'? Almost two thirds were satisfied with the amount of teaching (see Table 28).

Table 28 **How do you feel about the balance between teaching/supervising and other work in your PhD?**

Answer	N	%
1. I would like to teach/supervise less	124	16.9
2. I am satisfied with the amount of time I spend teaching/supervising	482	65.6
3. I would like to teach/supervise more	129	17.5
Total	735	100.0

Reasons not to teach/supervise

The PhD students who were not involved in teaching (N = 207) were asked for their reasons. PhD students could choose multiple answers, and a total of 227 answers were given by 207 PhD students. Of the 89 PhD students who selected 'Other, namely', the answers of 56 PhD students could be transferred to one of the three predefined categories and the remaining answers were combined into three new categories indicated with an * (see Table 29). One of the new answer categories 'no opportunity' was mentioned by 19% of the PhD students. The two most mentioned reasons were no time (29%) and lack of confidence (23%). These percentages were different in 2019 (no time: 18%, no confidence: 15%).

Table 29 **Reasons why PhD students do not teach/supervise**

Reason	N	%
1. I don't want to	29	11.8
2. I don't have time	71	29.0
3. I don't feel confident enough about my teaching/supervising skills	57	23.3
4. I do not have the opportunity to teach*	46	18.8
5. I will teach later during my PhD project*	15	6.1
6. Other	27	11.0
Total	207	100.0

New answer category constructed because at least 10 PhD students gave a similar answer at the option 'Other'.

Official and actual work hours

PhD students were asked to indicate how many hours a week they officially have to work (according to their contract or agreement) on their PhD project and how many hours they actually work on their project. As shown in Table 30, the majority (68%) have a full-time contract (36-40 hours) while 13% have a contract for less than 36 hours. Almost three quarters of all the PhD students (including those without official working hours) indicated working more than 36 hours on their PhD project. Table 31 shows that 73% of PhD students work more than 36 hours per week.

Table 30   **How many hours per week do you officially have to work on your PhD project, according to your contract or agreement?**

Answer	N	%
1. I have a contract or agreement without hour specification	206	19.4
2. Part-time (less than 36 hours per week)	136	12.8
3. Full-time (more than 36 hours per week)	721	67.8
Total	1063	100.0

Table 31   **In an average week, how many hours do you actually work on your PhD project?**

Answer		N	%
1.	Less than 12 hours per week	40	3.6
2.	Between 12-36 hours per week	265	23.6
3.	Between 37-48 hours per week	614	54.7
4.	More than 48 hours per week	204	18.2
Total		1123	100.0

Figure 4 displays the actual working hours for the three groups (contract/agreement with no hour specification, part-time contract/agreement and full-time contract/agreement). Of the PhD students with a part-time contract, 40% work more than 36 hours per week. Of the PhD students with a full-time contract, 63% work on average between 36 to 48 hours, while an additional 20% work even more than 48 hours per week.
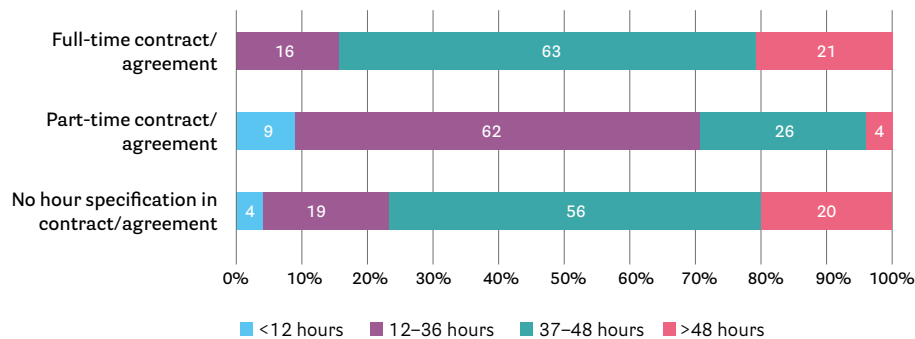
Figure 4   **Percentages of PhD students who work on average < 12, 12-36, 37-48 or 48 hours per week, by type of contract/agreement.**

Contract hours versus actual working hours

For the 857 PhD students with a contract/agreement with hour specification, the actual working hours and official contract hours were compared. About 10% work approximately the hours stated in their contract, 14% work less and 76% work more. The percentage of PhD students working 'overtime' has increased in 2021 (75%) compared to 2019 (55%) and 2017 (58%) as shown in Figure 5. These results are comparable to the results of and UK study, on the effects of Covid-19 on researchers. This study showed both an increase in researchers working less and other researchers working more than their contract hours, as we also see in our sample.
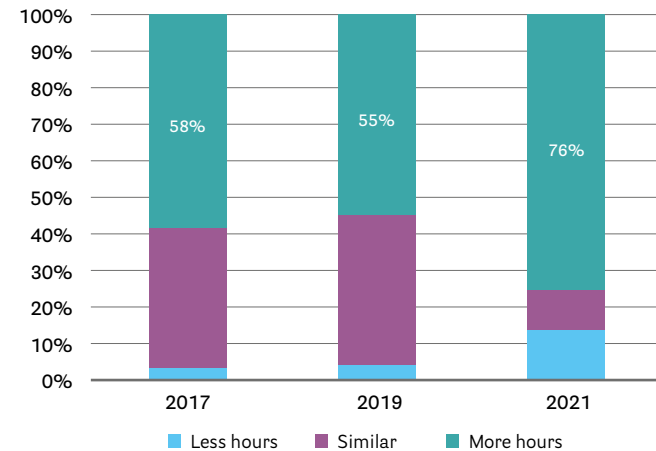
Figure 5   **Percentage of students who work less, similar of more hours than stated in their contract/agreement.**

Group differences
The percentage of 'overtime' (defined as the percentage of PhD students who work more hours than stated in their contract/agreement) was examined for different groups. PhD students in the middle of their trajectory significantly do more overtime (78%) compared to those in their first (75%) and final years (74%). Moreover, PhD students with a non-EER nationality (85%) do significantly more overtime than those with an EER (79%) or Dutch (69%) nationality.

Table 32 shows the differences in overtime by Graduate School. When only considering Graduate Schools with more than 15 respondents, we see that especially PhD students from GSMS (77%) and GSSE (85%) worked more than their contract hours. This result might be associated with a high proportion of PhD students with a non-Dutch nationality in these Graduate Schools.

Table 32 PhD students reporting overtime by Graduate School

Graduate School	N	% over-hours
Behavioural and Social Sciences	70	58.6
Campus Fryslân*	13	69.2
Economics and Business (SOM)	47	63.8
Humanities	60	63.3
Law	17	52.9
Medical Sciences	303	76.9
Philosophy*	5	100.0
Science and Engineering	311	85.2
Spatial Sciences	24	70.8
Theology and Religious Studies*	7	42.9

* GSP, GSCF and GSTRS were not included in statistical tests

Workload

When asked about workload, 58% of the PhD students answered that their workload was high (49%), while 40% described their workload as normal. These percentages are similar to the results of 2019. Overall, a little over half (55%) were somewhat bothered by their workload; 18% considerably and 4% extremely. Table 33 shows to what extent PhD students were bothered by their workload for each of the five workload categories.

Table 33 To what extent does your workload bother you?

Workload	Bothered by workload	N	%
Too high (9%)	Not at all	1	1.0
	Somewhat	19	19.0
	Considerably	44	44.0
	Extremely	36	36.0
	Total	100	100.0
High (49%)	Not at all	45	8.2
	Somewhat	356	64.6
	Considerably	141	25.6
	Extremely	9	1.6
	Total	551	100.0
Normal (40%)	Not at all	204	45.5
	Somewhat	228	50.9
	Considerably	15	3.3
	Extremely	1	0.2
	Total	448	100.0
Low (2%)	Not at all	8	36.4
	Somewhat	14	63.6
	Total	22	100.0
Too low (<1%)	Considerably	1	50.0
	Extremely	1	50.0
	Total	2	100.0

Reasons for high workload

PhD students who indicated they experienced a high or too high a workload (N = 651) were asked to indicate the main reasons. They could choose three reasons from a list. The results are displayed in Table 34. As in previous years, 'complexity, amount and/or pace of work' was mentioned most by PhD students (26%), followed by 'publication pressure' (16%) and 'deadlines' (16%). This year the new category 'Covid-19 related issues' was also frequently mentioned (15%) as a reason for a heavy workload.

Table 34 What are the main reasons for your heavy workload? Please indicate a maximum of 3

Reasons for heavy workload	N	%
1. Pressure to publish	268	16.1
2. Deadlines	259	15.6
3. Other required activities, e.g. teaching	150	9.0
4. Problems with equipment and facilities	93	5.6
5. Problems due to working with living subjects and/or animals	58	3.5
6. Complexity, amount and/or pace of work	373	22.4
7. Contact with supervisors and/or colleagues	84	5.1
8. Significant personal events	110	6.6
9. Covid-19 related issues	251	15.1
10. Other reasons	17	1.0
Total number of mentioned reasons	1663	

Note: *50 PhD students chose the option 'other' of which the answers of 33 PhD students could be included in existing answer categories. The percentages refer to the total number of reasons mentioned* .

Group differences
Differences with regard to experienced workload were present with regard to phase, type of PhD student and nationality. Workload increases with progression in the PhD trajectory. A high workload was experienced by 51% of intermediors and 53% of seniors compared to 41% of starting PhD students. Too high a workload was experienced by 4% of starters, 8% of intermediors and 15% of seniors. Seniors, in particular, were considerably bothered by their workload (23% vs 14% and 16% of the intermediors and starters, respectively). With regard to nationality, PhD students from non-EER countries reported experiencing a high or too a high workload to a lesser degree (50%) than PhD students from EER countries (65%) and the Netherlands (63%). PhD students from EER countries were considerably more bothered by their high workload (25% vs 17% and 15% for Dutch and non-EER nationalities, respectively). Table 35 shows that employed PhD students (both types 1a and 1b) especially experienced too high a workload.

Table 35 How would you describe the workload or time pressure in your PhD project? (presented by type of PhD student)

Workload	Too high	High	Normal	(Too) low
VSNU PhD student type	%	%	%	%
1a. Employed PhD student	11.7	53.4	33.1	1.8
1b. Employee in PhD track	12.5	58.3	29.2	0.0
2a. PhD student on UG/UMCG scholarship	7.8	54.7	36.6	0.8
2b. PhD student on other scholarship	5.4	30.0	61.1	3.5
3. Externally funded PhD student	2.5	59.3	35.8	2.5
4. External PhD student	9.6	41.1	45.2	4.1

Chapter conclusion

Overall, PhD students were satisfied with their PhD trajectory. Comparable to 2017 and 2019, almost 80% of the PhD students were satisfied to very satisfied with their supervision. Only 4% of PhD students reported having only one supervisor, a decrease of 14% compared to 2019. Similar to 2019, roughly one third designed or codesigned their project with their supervisor, one third primarily did so by themselves and for one-third the supervisor designed most or all of the project. The contribution of the supervisor was higher for employed PhD students (1a) and lower for PhD scholarship students (2a/2b). Most PhD students largely agreed with statements about the high level of freedom in their project.

Similar to 2019, about 85% felt supported by their Graduate School, especially in offering courses and workshops and providing information. Overall, PhD students were to a great extent satisfied with their Graduate School, although differences were present between Graduate Schools.

With regard to teaching, we found that employed PhD students (1a) and PhD scholarship students (2a) were the two types of PhD students who were most involved in teaching. Employed PhD students are often obliged to teach by agreements in their contract, while for PhD scholarship students it is voluntary and only allowed as part of their training programme. The percentage of PhD students who felt unprepared for teaching increased from 58% in 2017 to 66% in 2019 and 2021. This is a surprising finding in view of the increased opportunities for teaching training within the newly developed Career Perspectives Series (see Chapter 10). Future surveys should aim to identify the aspects of teaching/supervising these PhD students feel unprepared for, in relation to attendance of specific teaching training courses.

Just over half of the PhD students rated their mental health as good to very good and one-third as fair. PhD students from outside the Netherlands rated their mental health as less good than Dutch PhD students. One third of the total sample stated that their PhD project had (rather) negative influence on their mental health. This seems to be most prevalent among PhD students from EER countries and for PhD students in the last phase of their project.

Experienced workload is comparable to 2019. Reasons for a heavy workload were similar to previous years. In this survey, Covid-19 was mentioned as an additional reason but to a lesser extent than work complexity, deadlines and publication pressure.

5 Impact of Covid-19 on wellbeing and progress

This chapter concerns the impact of Covid-19 on the wellbeing of PhD students and progression in their project. Planning and delay are considered, together with doubts about the continuation of the project. For PhD students who are delayed, the length of the delay, reasons for delay and whether agreements about extensions have been made, are examined.

Covid-19

This year, questions about the impact of the Covid-19 situation were added to the survey. These questions were inspired by Vitae,[2] which performed a large study in the United Kingdom on the impact of Covid-19 on doctoral students and early career research staff.

UG PhD students were first asked what impact Covid-19 had on their project and on themselves and secondly, on the ability to engage in several aspects of their PhD project. Answer options were strongly negative (1), negative, no impact, positive, strongly positive (5). Depending on the aspect, between 1 and 9% of the PhD students indicated that the aspect did not apply to them.

The distribution over the answer categories concerning the question, 'What impact has Covid-19 had on the ability to engage in the following aspects of your PhD project?' is indicated in Figure 6. The following aspects had the most negative impact: 'Discussing ideas and findings with colleagues and peers' (87%) and 'Dissemination/sharing research findings with stakeholders/researchers' (72%). Moreover, almost two-thirds (63%) of the PhD students indicated that their data collection was impacted by the pandemic, whereas only one third indicated an impact on data analysis and writing.
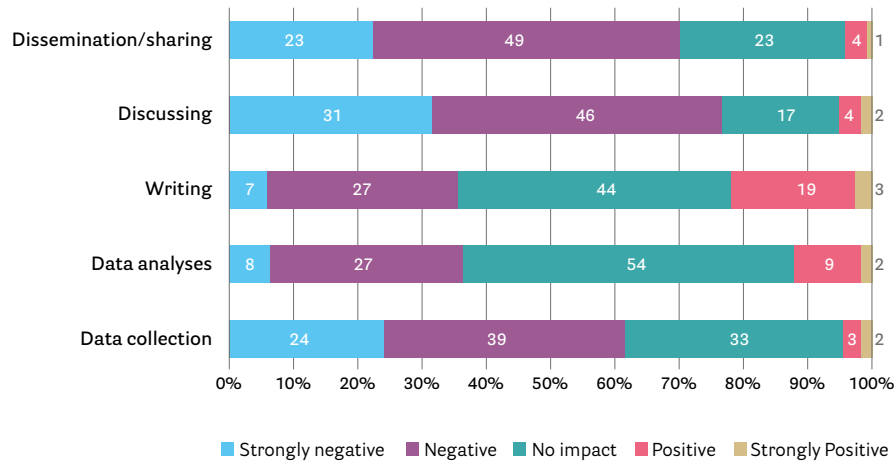
2   https://www.vitae.ac.uk/impact-and-evaluation/covid-19-impact-on-researchers.

Figure 6 showing horizontal stacked bar chart with categories:
- Dissemination/sharing: 23 | 49 | 23 | 4 | 1
- Discussing: 31 | 46 | 17 | 4 | 2
- Writing: 7 | 27 | 44 | 19 | 3
- Data analyses: 8 | 27 | 54 | 9 | 2
- Data collection: 24 | 39 | 33 | 3 | 2

Legend: ■ Strongly negative ■ Negative ■ No impact ■ Positive ■ Strongly Positive

Figure 6   **Impact of Covid-19 on the ability to engage in aspects of the PhD project.**

The distribution over the answer categories concerning the question, 'What impact has Covid-19 had on other aspects of your PhD project?' is presented in Figure 7. Almost 70% of the PhD students indicated that their mental health (69%) and progress (68%) were (strongly) negatively affected. Moreover, an effect on their motivation to work on their project was mentioned by 60%. Over half of the PhD students indicated that the Covid-19 situation had not impacted their future career prospects, while 40% indicated that it had.

Figure 7 showing horizontal stacked bar chart with categories:
- Mental heath: 31 | 46 | 17 | 4 | 2
- Future career prospects: 7 | 27 | 44 | 19 | 3
- Progress: 8 | 27 | 54 | 9 | 2
- Motivation: 24 | 39 | 33 | 3 | 2

Legend: ■ Strongly negative ■ Negative ■ No impact ■ Positive ■ Strongly Positive
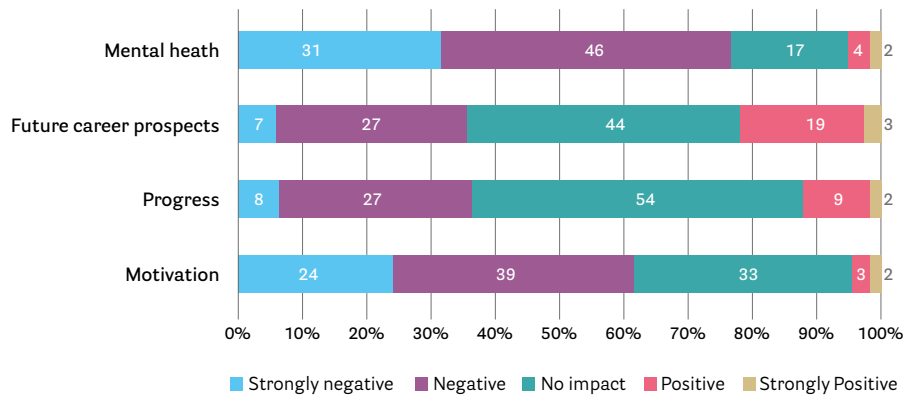
Figure 7   **Impact of Covid-19 on other aspects.**

Doubts about the continuation of the PhD project

Nearly two thirds of the PhD students (N = 682, 61%) answered the question, 'Have you ever considered quitting your PhD project?', with 'No, never'. Among the PhD students who indicated that they had considered quitting (29%), only a few had this thought often (5%) or very often (6%). These percentages are more or less comparable to 2019.

Between 2017 and 2019 there was a major increase in Dutch PhD students who considered quitting (from 26% in 2017 to 41% in 2019). The percentage of PhD students who actually quit was 3% in both '2018/19 and '2019/20. Similarly to 2019, we see that around 40% of Dutch PhD students indicated that they had considered quitting more than once. In both 2017 and 2019, 32% of the non-Dutch PhD students considered quitting. This year we divided the internationals into PhD students from EER countries and non-EER countries and observed that PhD students from EER countries considered quitting more often than those from a non-EER country and even more than Dutch PhD students. As in previous years, PhD students who have worked for a longer time on their thesis had considered quitting more often (see Figure 8).

Figure 8 showing horizontal stacked bar chart:
- Starter (n=274): 24 | 76
- Intermedior (n=495): 39 | 61
- Senior (n=354): 51 | 49

Legend: ■ Yes ■ No

Figure 8   **Ever considered quitting PhD project, by phase.**

Differences were present between Graduate Schools, where PhD students from the Graduate School of Economics and Business (55%) and Campus Fryslân (57%) considered quitting the most (see Figure 9). No differences were found for PhD student type.
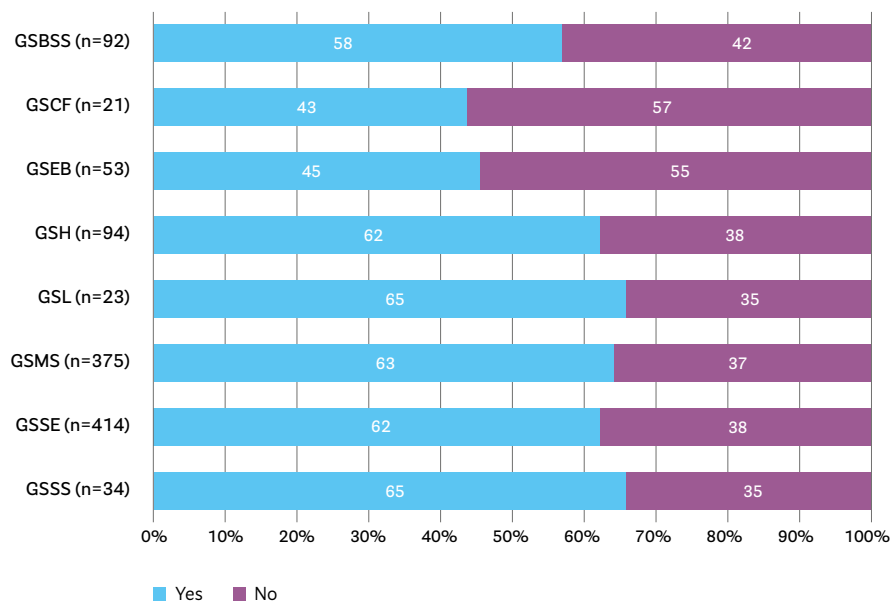
Figure 9   Ever considered quitting PhD project, by Graduate School.

Acronyms: *GSBSS = Graduate School of Behavioural and Social Sciences, GSCF = Graduate School of Campus Fryslân, GSEB = Graduate School of Economics and Business, GSH = Graduate School of Humanities, GSL = Graduate School of Law, GSMS = Graduate School of Medical Sciences, GSSE = Graduate School of Science and Engineering, GSSS = Graduate School of Spatial Sciences*

Reasons for quitting

PhD students who had considered quitting (N = 442, 39%) were asked to indicate their three main reasons (see Table 36). The main reasons (mentioned by at least 40% of the PhD students who had considered quitting) were uncertainty about capabilities (55%), not enjoying PhD anymore (60%) and mental health problems (44%). In 20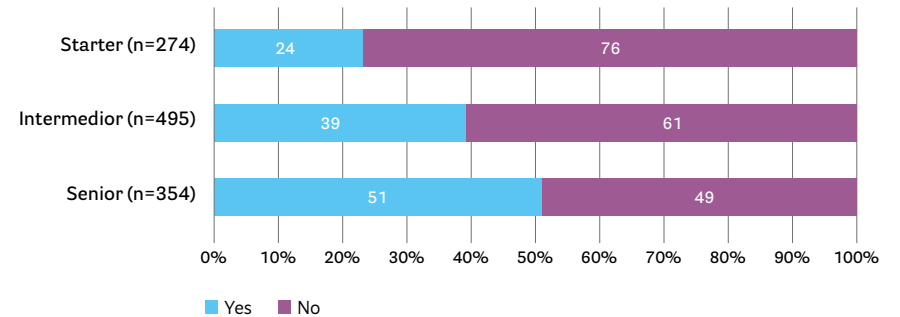19, the most prominent reasons were uncertainty about own capabilities, high workload and problems with supervisors/colleagues. The results of 2021 might reflect the underlying consequences of the Covid-19 pandemic with regard to motivation and mental health.

Table 36   **What are/were the reasons for you considering to quit your PhD project? Please indicate a maximum of 3.**

Reason	N	%
1. Uncertainty about my capabilities	241	54.6
2. High workload	138	31.3
3. Problems with supervisors	92	20.9
4. Problems with colleagues	22	5.0
5. Not enjoying PhD (anymore)	263	59.6
6. Physical health problems	23	5.2
7. Mental health problems	192	43.5
8. Other reason	52	54.6

Note: *Reasons mentioned in the category 'Other' concerned work-life balance, uncertainty about the future, problems with work environment, Covid-19 related problems.*

Planning and delay

Table 37 presents the responses to the question, 'Are you currently on schedule with your planning?' Comparable to previous surveys, almost 40% were on schedule. However, almost 50% had fallen behind, which is more than in 2019 (around 25%).

Table 37   **Are you currently on schedule with your planning?**

Answer	N	%
1. Yes	436	38.8
2. No, I am ahead of schedule	26	2.3
3. No, I have fallen behind schedule	550	49.0
4. I don't have a schedule	58	5.2
5. I don't know	53	4.7
Total	1123	100.0

Group differences

Figures 10 to 12 display the answer categories for phase, PhD student type and Graduate School (where the category 'Yes' also includes the answer 'I am ahead of schedule'; and the answers 'No planning' and 'Don't know' are combined). Figure 10 shows the answer categories by phase. As in previous years, we see that the highest percentage on schedule are the starters; and that this percentage drops as PhD students progress in their project.
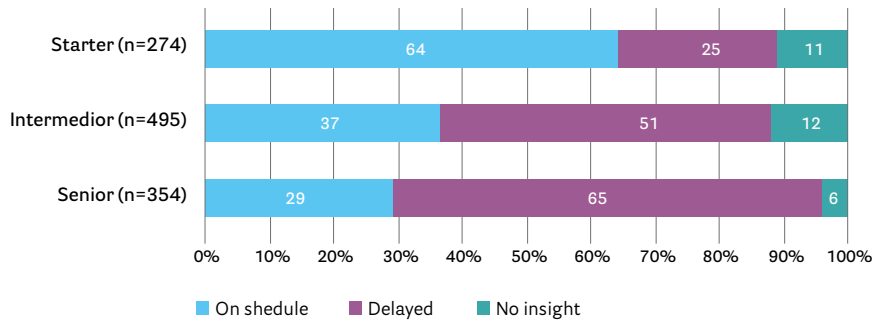
Figure 10   **Percentage of PhD students indicating if they are on schedule, by phase.**

Figure 11 shows differences between the different PhD student types. Almost one quarter of employees in a PhD track (1b) have no insight into their planning. A relatively low percentage of externally financed PhD students indicated they were on schedule (32%).
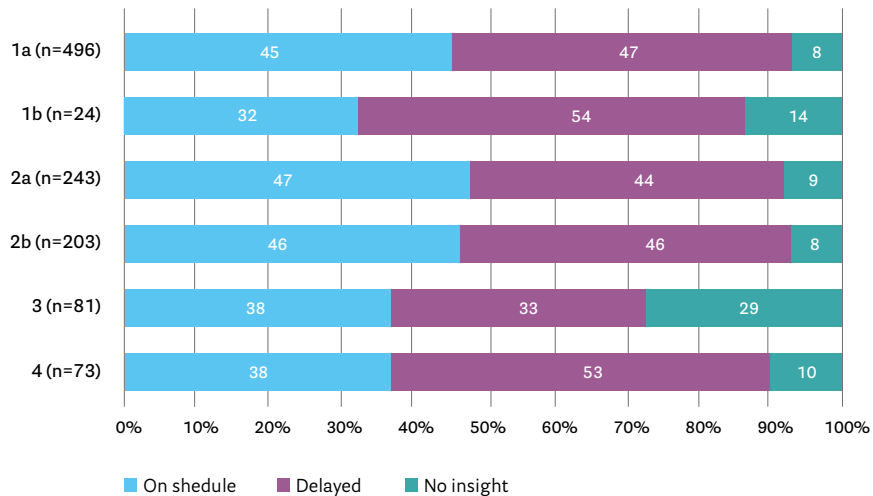
Figure 11   **Percentage of PhD students indicating if they are on schedule, by PhD student type.**

Abbreviation: *1a = employed PhD student, 1b = employee in PhD track, 2a = PhD student on UG/UMCG scholarship, 2b = PhD student on other scholarship, 3 = externally funded PhD student, 4 = external PhD student*

Figure 12 shows differences between the largest Graduate Schools. GSSS seems to be the Graduate School with the highest percentage of PhD students that are on schedule (56%). A relatively high proportion of PhD students (22%) in GSL do not have insight into their planning.
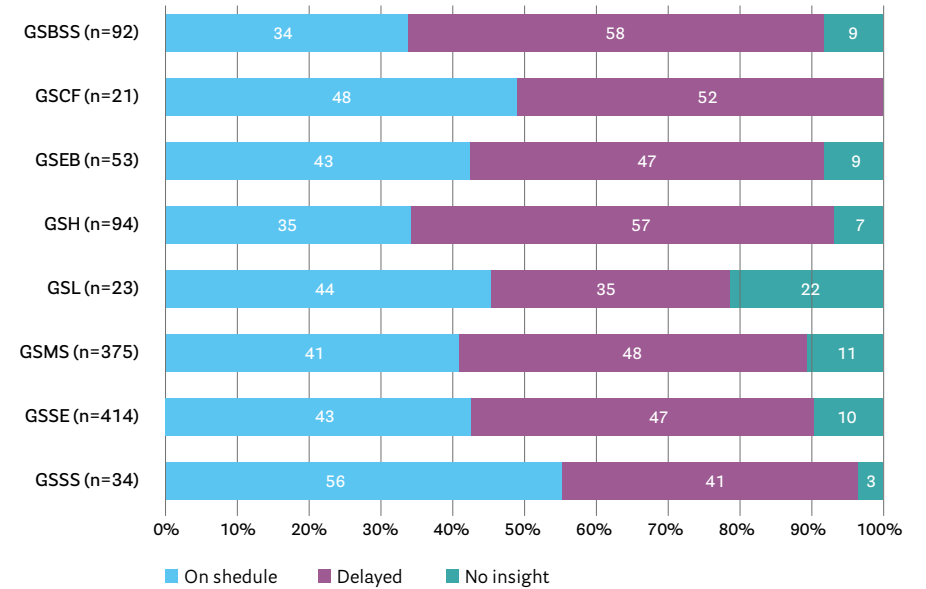
Figure 12   **Percentage of PhD students indicating if they are on schedule, by Graduate School.**

Acronyms: *GSBSS = Graduate School of Behavioural and Social Sciences, GSCF = Graduate School of Campus Fryslân, GSEB = Graduate School of Economics and Business, GSH = Graduate School of Humanities, GSL = Graduate School of Law, GSMS = Graduate School of Medical Sciences, GSSE = Graduate School of Science and Engineering, GSSS = Graduate School of Spatial Sciences*

Self-reported expected delay

PhD students who indicated they were delayed (N = 550) were asked to estimate their expected delay (see Figure 13). About 12% expected a delay of less than three months, almost 40% expected a delay of between three to six months, 21% expected a delay of up to half a year (12% in 2019), while 13% expected a delay of nine months or more. Although the categories are not comparable to those of 2019, overall, the expected delay is higher compared to that reported in the survey of 2019. Almost 16% did not know how long their delay would be.
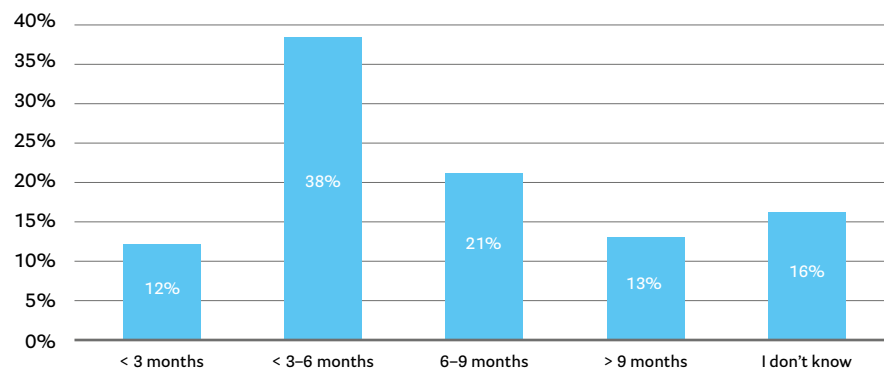
Figure 13 Self-reported expected delay

Table 38 Reasons for delay (multiple reasons allowed)

Reason	N	%
1. Lack of motivation	170	**30.9**
2. I have become completely stuck	100	18.2
3. My planning is too tight	71	12.9
4. My project is too big	97	17.6
5. My project is too complex	124	22.5
6. I have experienced too many practical setbacks (e.g. problems with equipment/data collection)	262	**47.6**
7. I have lost too much time because of my teaching load	47	8.5
8. I have lost too much time because of my work on side projects or other tasks	95	17.3
9. The demands from my supervisor are too high	35	6.4
10. I do not receive enough assistance or supervision	106	19.3
11. Pregnancy	24	4.4
12. Illness	81	14.7
13. Personal circumstances	154	**28.0**
14. I have a job apart from my PhD	51	9.3
15. Due to Covid-19	371	**67.5**
16. Other reasons	18	3.3
Total	550	100.0

Note: *Blue indicates reasons mentioned by > 25% of the respondents*

Reasons for delay

PhD students could indicate the main reasons for their delay. The average number of reasons given was 3.3 (Sd = 1.8, min. 1, max 11 reasons). As shown in Table 38, Covid-19 (68%) was mentioned most, followed by practical setbacks (48%), lack of motivation (31%) and personal circumstances (28%). In 2019, the most mentioned reasons were practical setbacks (49%), too complex a project (29%) and too big a project (25%). Personal circumstances (19%) and lack of motivation (16%) were also mentioned in 2019 but less than in 2021.

Table 39 Reasons indicated for delay, by Graduate School

	GSBSS	GSEB	GSH	GSMS	GSSE
Total number of PhD students who report being delayed	**53**	**25**	**54**	**179**	**193**
Reason	%	%	%	%	%
1. Lack of motivation	**32**	**52**	19	21	**39**
2. I have become completely stuck	17	16	15	8	**29**
3. My planning is too tight	15	8	7	18	9
4. My project is too big	17	20	7	18	22
5. My project is too complex	17	**36**	11	22	**27**
6. I have experienced too many practical setbacks (e.g. problems with equipment/data collection)	**45**	**28**	**33**	**45**	**55**
7. I have lost too much time because of my teaching load	17	8	7	4	9
8. I have lost too much time because of my work on side projects or other tasks	**30**	12	7	16	15
9. The demands from my supervisor are too high	8	20	6	4	6
10. I do not receive enough assistance or supervision	8	16	15	13	23
11. Pregnancy	6	4	6	6	3
12. Illness	**25**	**28**	22	9	11
13. Personal circumstances	**36**	**48**	**33**	18	24
14. I have a job apart from my PhD	17	4	15	11	5
15. Due to Covid-19	**53**	**68**	**74**	**60**	**68**

Acronyms: *GSBSS = Graduate School of Behavioural and Social Sciences, GSEB = Graduate School of Economics and Business, GSH = Graduate School of Humanities, GSMS = Graduate School of Medical Sciences, GSSE = Graduate School of Science and Engineering. Only Graduate Schools with at least 15 respondents are included in the table.*
Note: *Blue indicates reasons mentioned by > 25% of the respondents.*

Table 39 shows the detailed results for Graduate Schools with at least 15 respondents who reported being delayed. Percentages over 25% are indicated in blue. Covid-19 was generally mentioned most as the reason for delay by PhD students from all Graduate Schools, but most often by those from GSH. Another often mentioned reason was technical setbacks, which were most prominent at GSBSS (45%), GSMS (45%) and GSSE (55%). Lack of motivation was mentioned relatively more often at GSEB (52%) and GSSE (39%). Personal circumstances were mentioned more often by PhD students from GSEB (48%). In addition, a relatively large proportion of PhD students from GSEB mentioned that their project was too complex (36%).

Agreements about extension

Almost 50% of the delayed PhD students stated that no agreements about an extension had been made (yet) (see Table 40). This should be seen in the light of the fact that formal agreements about extensions are usually only made during the last six months of the contract.

Table 40 **Have agreements been made about a possible extension of the contract?**

Answer	N	%
1. Yes, formal agreements about an extension	126	22.9
2. Yes, informal agreements about an extension	75	13.6
3. Extension is not possible	63	11.5
4. No agreements have been made (yet)	267	48.5
5. Other	19	3.5
Total	550	100.0

Chapter conclusion

For a large majority, Covid-19 had a negative impact on PhD students' ability to engage in specific aspects of their PhD project, namely the discussion of ideas and findings with supervisors, colleagues and other stakeholders and data analysis and writing. Moreover, for two thirds, the pandemic influenced their data collection in a negative manner.

Overall, 29% had thoughts about quitting their project, which is comparable to the survey of 2017 (26%). In 2019 the percentage of PhD students who considered quitting at least once was higher (41%). The percentage of PhD students who actually quit was 3% in both 2018/19 and 2019/20.[3]

3   https://www.rug.nl/education/phd-programmes/phd-scholarship-programme/about/evaluation

Periods of doubt are common in PhD trajectories, especially in the first year and nine to twelve months before finishing, as PhD students are often uncertain about their capabilities and experience a high workload. In this survey, the PhD students often mentioned general and Covid-19-related mental health problems and lack of motivation as reasons why they considered quitting.

The proportion of PhD students who are delayed increased from around 25% in 2019 to 50% in 2021. This seems largely due to the effects of Covid-19, as this was the most mentioned reason for delay.

6 Relationships with supervisors and colleagues

This chapter describes how PhD students relate to their supervisors, colleagues and their department. PhD students were asked to answer questions separately for their primary supervisor ('promotor') and daily supervisor. In the case of more than one person acting in the role of primary supervisor, the primary supervisor was defined as the person who the PhD student worked with the most. The daily supervisor was defined as the person in the supervisory team with whom the PhD student worked most closely. The role of daily supervisor could also be filled by someone who was not part of the official supervisory team. If a PhD student considered the primary supervisor and daily supervisor to be the same person, the PhD student could ignore the questions for the daily supervisor.

Daily supervisor

Of the PhD students, 52% (42% in 2019) indicated that the daily supervisor was the same person as the first supervisor ('promotor'), while 33% (40% in 2019) indicated that the daily supervisor was their 'co-promotor' (see Table 41). Almost 2% answered that they did not have a daily supervisor; this is the same percentage as in 2019.

Table 41 **Who do you consider your daily supervisor?**

Answer	N	%
1. (One of) my promotor(s)	587	52.3
2. (One of) my co-promotor(s)	371	33.0
3. A post-doc	109	9.7
4. Other	36	3.2
5. I have no daily supervisor	20	1.8
Total	1123	100.0

Frequency of meetings with first and daily supervisor

As shown in Table 42, 34% of PhD students indicated that they had a meeting/appointment with their daily supervisor about once a week. This is less than in 2019 where 38% had a weekly meeting with their daily supervisor. Less than one quarter of PhD students (23%) met

with their first supervisor about once a month (25% in 2019). However, the percentage of PhD students who had a meeting with their first supervisor at least once a week has slightly increased from 21 to 23%. The proportion that had a meeting less than once a month has decreased from 27 to 23%. As found in previous years, PhD students meet with their daily supervisor more often than with their first supervisor.

Table 42   How often do you have an appointment/meeting with your supervisor?

	N	Less than once a quarter	Less than once a month	About once a month	Several times a month	About once a week	Several times a week	Not applicable
First supervisor	1123	9.6	13.6	22.8	23.1	23.3	3.9	3.7
Daily supervisor	1123	1.8	4.5	9.9	21	33.7	7.7	21.5

Group differences

As the amount of supervision might vary across the phases of a PhD project, Figure 14 and Figure 15 visualize how often PhD students meet their first supervisor (Figure 14) and daily supervisor (Figure 15) in each phase of the PhD project. Figure 14 shows that 30% of the starting PhD students meet about once a week with their first supervisor, 24% meet several times a month, 23% about once a month and 12% meet less than once a month. The frequency of meetings with the first supervisor decreases as the PhD students progress to later phases of their project.
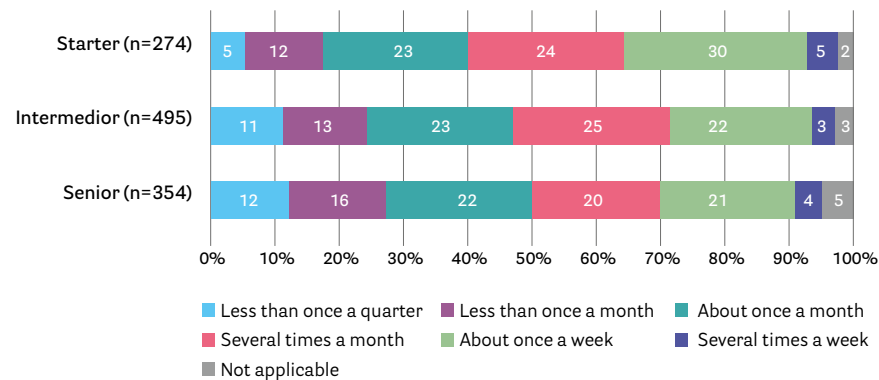
Figure 14   Frequency of meetings with first supervisor, by phase

Of the PhD students in their first year, 28% had a meeting with their daily supervisor about once a week and 21% less than once a week (see Figure 15). Interestingly, weekly meetings with the daily supervisor increased during the project (34% for intermediors and 41% of seniors).
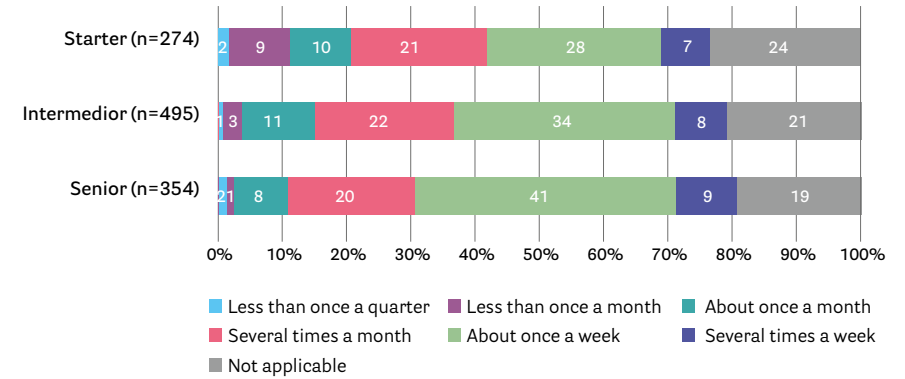
Figure 15   Frequency of meetings with daily supervisor, by phase

Figure 16 presents the frequencies of meetings with the first supervisor by Graduate School. The categories of 'About once a month' and 'Several times a month' were the most often chosen for most Graduate Schools except for GSMS and GSSE, of which a relative high proportion of PhD students indicated they met once a week. Interestingly, at five Graduate Schools, PhD students indicated that meeting with their first supervisor does not apply to them (GSBSS: 3%; GSH: 7%; GSMS: 2%; GSSE: 5% and GSSS: 3%). We think these PhD students might be supervised by staff without *ius promovendi* (right to promote) and for whom the first supervisor is not so closely involved.
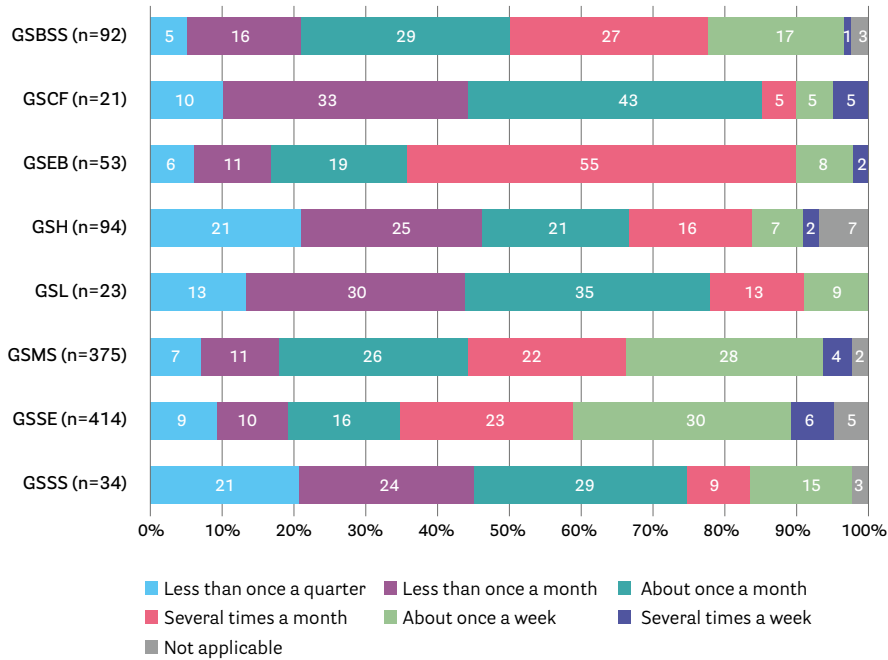
Figure 16 Frequencies of meetings with first supervisor, by Graduate School

Acronyms: *GSBSS = Graduate School of Behavioural and Social Sciences, GSCF = Graduate School of Campus Fryslân, GSEB = Graduate School of Economics and Business, GSH = Graduate School of Humanities, GSL = Graduate School of Law, GSMS = Graduate School of Medical Sciences, GSSE = Graduate School of Science and Engineering, GSSS = Graduate School of Spatial Sciences*

For daily supervisors, 'Several times a month' and 'Once a week' were most frequently chosen for most Graduate Schools although a relative high proportion of PhD students from GSH and HSL indicated they met once a month (Figure 17).
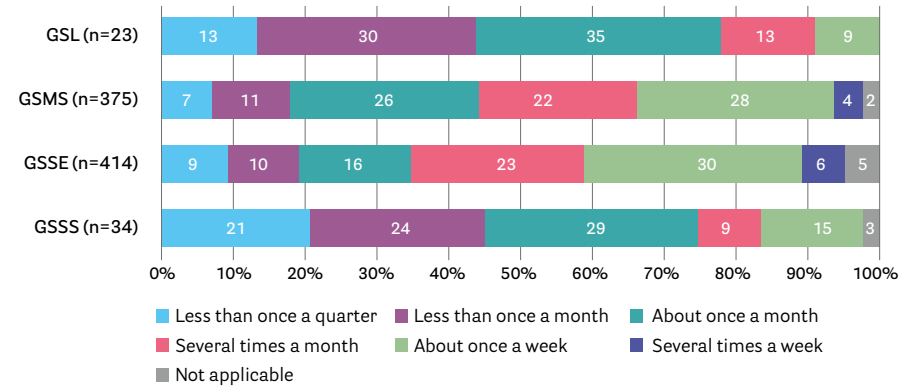
Figure 17 Frequencies of meetings with daily supervisor, by Graduate School

Acronyms: *GSL = Graduate School of Law, GSMS = Graduate School of Medical Sciences, GSSE = Graduate School of Science and Engineering, GSSS = Graduate School of Spatial Sciences*

Relationship with first and daily supervisors

PhD students were asked to indicate how they would describe their relationship with their supervisors. One third described the relationship with their daily supervisor as 'Good' (33%) and almost two thirds (59%) classified it as 'Very good'. For the relationship with the first supervisor these percentages are slightly different, namely 40% 'Good' and 47% 'Very Good'. Similarly to 2019, 40% described the relationship with the first supervisor as 'Good' (43% in 2019) and 47% chose 'Very good' (42% in 2019). The percentages of all categories are shown in Figure 18.
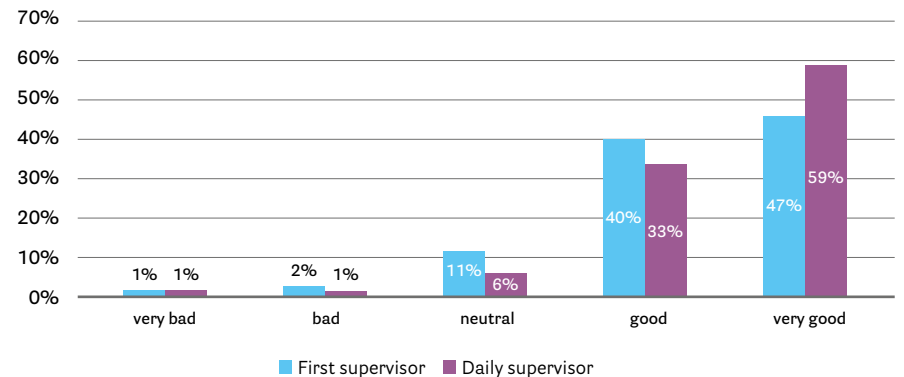
Figure 18 Overall, how would you describe your relationship with your supervisor?

Group differences

Figure 19 shows the differences in the relationship with the first supervisor between PhD students from different Graduate Schools. Most of the PhD students would describe their relationship as either 'Good' or 'Very good'. More than half of the PhD students in GSCF (55%) and GSEB (53%) described the relationship with their primary supervisor as 'Good', while almost 60% of the PhD students in GSSS (58%) described the relationship as 'Very good'. As shown in Figure 20, PhD students from different Graduate Schools show fewer differences in the description of their relationship with their daily supervisor.
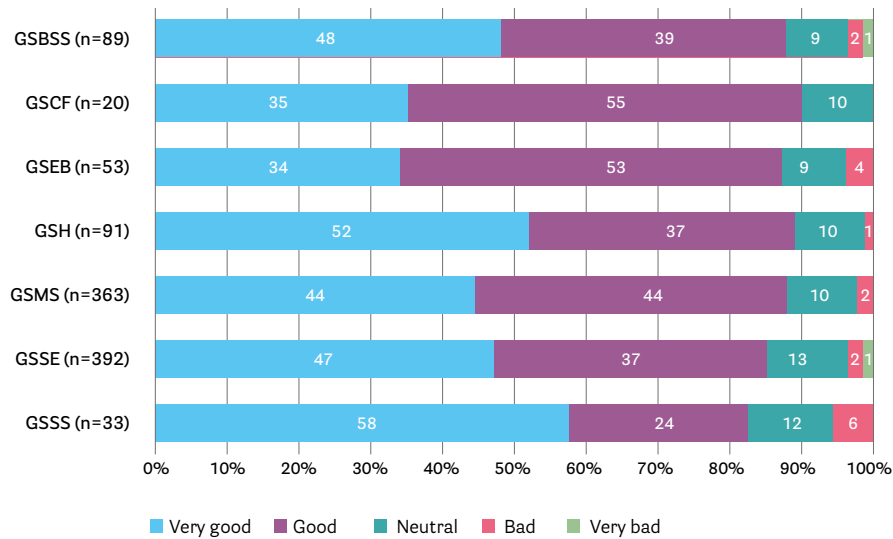
Figure 19 **Overall, how would you describe your relationship with your first supervisor?**
(presented for Graduate Schools with more than 15 participants

Acronyms: *GSBSS = Graduate School of Behavioural and Social Sciences, GSCF = Graduate School of Campus Fryslân, GSEB = Graduate School of Economics and Business, GSH = Graduate School of Humanities, GSL = Graduate School of Law, GSMS = Graduate School of Medical Sciences, GSSE = Graduate School of Science and Engineering*
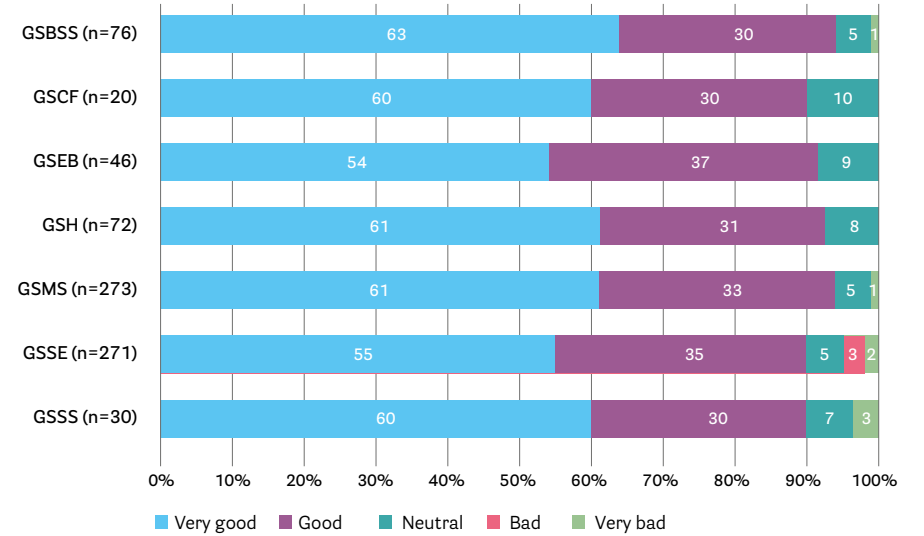
Figure 20 **Overall, how would you describe your relationship with your daily supervisor?**
(presented for Graduate Schools with more than 15 participants)

Acronyms: *GSBSS = Graduate School of Behavioural and Social Sciences, GSCF = Graduate School of Campus Fryslân, GSEB = Graduate School of Economics and Business, GSH = Graduate School of Humanities, GSL = Graduate School of Law, GSMS = Graduate School of Medical Sciences, GSSE = Graduate School of Science and Engineering, GSSS = Graduate School of Spatial Sciences*

Supervisors' availability and different types of support

Using a five-point scale (from completely disagree [1] to completely agree [5]) PhD students were asked about the availability of their supervisors, the academic and personal support they provide, and the extent to which they support their path to autonomy as a researcher. Scale scores were calculated on the basis of the scores on the individual statements. A full overview of the item and scale scores are presented in Table 43, where the highest (green) and lowest (red) item score for each of the four scales – and for both supervisors – is indicated. A comparison between first supervisor and daily supervisor is displayed in Figure 21.

Table 43 An overview of the mean scores on each of the items, presented per scale and per supervisor

Statements	First supervisor			Daily supervisor		
Availability	N	M	Sd	N	M	Sd
My supervisor responds to my queries or requests for help within a reasonable time frame	1067	4.2	0.9	815	4.5	0.8
My supervisor provides me with prompt feedback whenever I submit written work to him/her	1045	4.1	1.0	804	4.3	0.9
My supervisor is available to answer any questions I have	1068	4.2	0.9	816	4.4	0.8
Scale score (α first = 0.94. α daily = 0.99)	1072	4.2	0.8	819	4.4	0.7
Academic support						
My supervisor helps me to plan and manage the different research tasks I have to complete	1047	3.5	1.1	802	3.8	1.0
My supervisor helps me construct timelines and deadlines to ensure that I complete tasks on time	1037	3.3	1.1	790	3.5	1.1
My supervisor gives me good, practical advice about how to plan and conduct my research	1055	3.8	1.0	807	4.0	0.9
My supervisor offers suggestions about how to find the resources I need	1051	3.8	0.9	805	4.1	0.8
My supervisor gives me guidance in finding relevant literature and research materials	1050	3.7	1.0	803	3.9	0.9
My supervisor helps me develop good writing skills (e.g. expression of ideas, grammar, structure of thesis, etc.)	1021	3.9	0.9	776	3.9	0.9
My supervisor looks for information that will help me with my thesis	1028	3.6	1.0	776	3.8	1.0
My supervisor teaches me the technical knowledge and skills that I need to complete my research	1023	3.3	1.1	786	3.7	1.0
My supervisor spends time helping me learn the skills I need to complete my research	1032	3.3	1.1	787	3.6	1.1
My supervisor provides practical assistance when I need help conducting research tasks	1011	3.3	1.2	791	3.8	1.0
Scale score (α first = 0.96, α daily = 0.97)	1071	3.6	0.8	1122	3.8	0.8
Personal support						
My supervisor behaves warmly towards me when discussing my research and/or any problems I am experiencing	1069	4.3	0.9	805	4.4	0.8
My supervisor expresses understanding and empathy when I experience difficulties	1056	4.2	0.9	804	4.3	0.8
My supervisor listens and responds to any concerns I have	1060	4.2	0.9	807	4.3	0.8
My supervisor is friendly, supportive and approachable	1067	4.3	0.9	807	4.4	0.8
My supervisor comforts and reassures me when I am feeling down	997	3.9	1.0	759	4.1	1.0
My supervisor compliments me and makes me feel good about myself and my work	1059	4.0	1.0	804	4.1	0.9
My supervisor shows me that he/she respects and values me	1066	4.2	0.9	808	4.2	0.9
My supervisor reassures me that I will be able to successfully complete my research/thesis	1041	4.1	0.9	790	4.1	0.9
My supervisor makes me feel that I have the ability to do well	1059	4.1	0.9	805	4.1	0.9
My supervisor is interested in my personal situation	1054	3.7	1.0	799	3.9	1.0
My supervisor tells me personal things about himself/herself	1049	3.5	1.1	797	3.8	1.0
My supervisor understands me	1053	3.7	0.9	806	3.9	0.9
My supervisor supports me when I have a conflict with a colleague	595	3.6	0.9	449	3.7	0.9
Scale score (α first = 0.95, α daily = 0.99)	1075	4.0	0.7	815	4.1	0.7
Autonomy						
My supervisor encourages me to ask questions	1054	4.1	0.8	803	4.2	0.8
My supervisor encourages me to be open about my own ideas and any issues that concern me	1052	4.1	0.9	803	4.2	0.8
My supervisor listens to how I would like to do things	1057	4.1	0.8	805	4.3	0.8
My supervisor welcomes my input in discussions and treats my ideas with respect	1058	4.3	0.8	806	4.3	0.7
My supervisor provides me with choices and options	1048	4.0	0.9	800	4.1	0.9
My supervisor encourages me to work independently	1053	4.3	0.8	799	4.3	0.8
My supervisor always presses his/her own point of view*	1052	3.2	1.1	800	3.3	1.2
My supervisor gives me the main responsibility for my project	1055	4.3	0.8	804	4.3	0.8
Scale score (α first = 0.99, α daily = 0.99)	1065	4.1	0.6	810	4.1	0.6

Note: *Green indicates the highest scale score in a group, red indicates the lowest score in the case of the maximum difference being statistically significant.*
* Recoded.

Figure 21 presents the mean scale scores for the first supervisor and daily supervisor. It is apparent that PhD students, on average, agree with the statements about the availability of their supervisors; PhD students generally indicated that their supervisors respond to their requests on time and that they receive sufficient personal support and autonomy. PhD students gave lower, but still positive, scores to academic support they received from their supervisors.

When the scale scores from both supervisors are compared, it is apparent that PhD students consider that their daily supervisor is more available, provides more support (academic and personal) and stimulates their autonomy more than their first supervisor. These differences are largest for the 'academic support' and 'availability' scores. These results are similar to those of 2019.
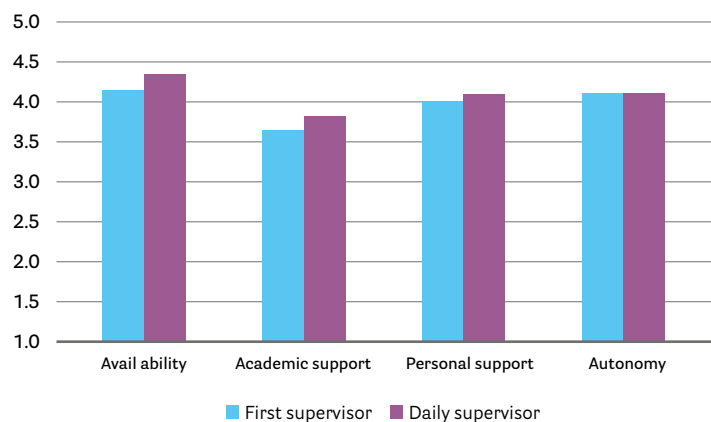
Figure 21 Average scale scores for first supervisor and daily supervisor

Group differences
Tables H1 to H4 in Appendix H present the mean scale scores for the first and daily supervisors by phase, nationality, PhD student type and Graduate School. A few general conclusions can be drawn:
- Starting PhD students were the most positive on all aspects.
- No clear differences were found for nationality, apart from the academic support scale, in which PhD students from non-EER countries were most positive.

- No clear differences were present between PhD student types except for academic support, which was the least for employees in a PhD track and highest for PhD students with a scholarship other than a UG/UCMG scholarship.
- Differences between Graduate Schools were more prominent (0.3 to 0.8) than in 2019.

Supervisors' expectations

PhD students were asked to indicate to what extent they agreed with statements about the expectations of their supervisors (scored on a five-point scale from completely disagree [1] to completely agree [5]; the scale score is not calculated, as it would be difficult to interpret). While some items can clearly be regarded as 'negative', such as, 'I feel that my supervisor is pushing me too much', this cannot be concluded for items such as, 'My supervisor expects me to publish in high-impact journals'. The item scores are presented in Table 44; the scores are comparable to those of 2019 and 2017.

For the item 'My supervisor expects all of my papers to be published before I submit my thesis', we see a slight drop in agreement scores for 2021 (2.6) compared to 2019 and 2017 (2.8) which is positive. It suggests that PhD supervisors adhere better than in the past to the PhD regulations, which state that the candidate can defend with publishable results and do not require already published results. Hopefully this trend will in the future lead to shorter duration of the PhD trajectories.

For two items, first supervisors expect slightly more from their PhD students than daily supervisors, although the differences are small. The three statements that can be regarded as most 'negative' are: 'I have the impression that nothing is good enough for my supervisor', 'I feel that my supervisor is pushing me too much' and 'My supervisor thinks that courses and seminars are a waste of time'. Clearly, these items are not an issue. These findings are similar to 2019.

Table 44 Average item scores on the supervisors' expectations

Statements	First supervisor			Daily supervisor		
	N	M	Sd	N	M	Sd
My supervisor expects me to publish in high-impact journals	1008	3.6	1.0	757	3.6	1.0
My supervisor expects all of my papers to be published before I submit my thesis	945	2.6	1.0	699	2.6	1.0
My supervisor expects me to finish my PhD in my spare time if I don't finish within the time of my contract	847	3.1	1.1	621	3.0	1.1
My supervisor thinks that courses and seminars are a waste of time	1024	2.0	1.0	770	2.0	0.9
My supervisor emphasizes the importance of finishing my PhD in time	1006	3.5	1.0	754	3.4	1.0
I have the impression that nothing is good enough for my supervisor	1044	2.0	1.0	788	2.0	1.0
I feel that my supervisor is pushing me too much	1052	2.0	1.0	793	2.0	1.0

Relationships with colleagues and sense of belonging

PhD students were asked to share their opinion about relationships within their department and the way they felt about being part of that department. This was done by asking them to score a number of statements (scored on a five-point scale from completely disagree [1] to completely agree [5]). A distinction was made between formal, work-related relationships (the academic relationship scale) and informal, socially related relationships (informal/social relationships). An overview of the item and scale scores is presented in Table 45.

The sense of belonging scale received, on average, the highest scale score (M = 3.7), which is similar to 2019. For this scale, PhD students agreed most with the statement, 'I get on well with most of the people in my department', while the statement, 'I feel at home in my department' received the lowest score. PhD students agreed, on average, a little less with the statements in the academic relationship scale (M = 3.5). The highest score for this scale was found for the statement, 'My interpersonal relationships with my colleagues have a positive influence on my performance'; while the statements, 'Colleagues invite me to work with them on projects or tasks' and 'It is easy to find colleagues to collaborate with' received the lowest average score. PhD students agreed the least with statements in the informal/social relationships scale (M = 3.3). Although PhD students indicated that 'Colleagues are interested in how I am doing', they agreed less with the statement, 'I regularly spend time outside work with my colleagues'. These findings are comparable to 2019.

Table I1 in Appendix present the mean scale scores for academic and informal relationship and sense of belonging by phase, nationality, PhD student type and Graduate School.

Table 45 Item and scale scores for the 'Academic relationship scale', 'Informal/social relationships scale' and 'Sense of belonging scale'

Academic relationship scale	N	M	Sd
Colleagues invite me to work with them on projects or tasks.	1004	3.1	1.1
It is easy to find colleagues to collaborate with.	1021	3.1	1.1
In my department. people often work together.	1031	3.4	1.0
Colleagues approach me to discuss their work.	1045	3.4	1.1
Colleagues appreciate my feedback.	1003	3.8	0.8
I collaborate well with my colleagues.	999	3.8	0.9
My interpersonal relationships with my colleagues have a positive influence on my performance.	1040	4.0	0.9
There are people to turn to in my department when I need help.	1059	3.9	0.9
Scale score (α = 0.89)	1089	3.5	0.8
Informal/social relationships	N	M	Sd
I know my colleagues quite well.	1071	3.4	1.0
My colleagues are interested in how I am doing.	1061	3.6	0.9
I regularly spend time outside work with my colleagues.	1048	2.9	1.2
I have close interpersonal relationships with my colleagues.	1056	3.0	1.2
Scale score (α = 0.89)	1077	3.3	1.0
Sense of belonging	N	M	Sd
I feel at home in my department.	1050	3.5	1.0
I enjoy the atmosphere in my department.	1041	3.7	0.9
This department is a good place for me to work.	1060	3.8	0.9
I get on well with most of the people in my department.	1043	4.0	0.7
I share the same values with most of the people in my department.	1018	3.7	0.9
Scale score (α = 0.91)	1065	3.7	0.8

Note: *Green indicates the highest scale score in a group, red indicates the lowest score in the case of the maximum difference being statistically significant.*

Chapter conclusion

For half of the PhD students, the daily supervisor is the same person as their first supervisor ('promotor'). This percentage increased by 10% compared to 2019. PhD students for whom the daily and first supervisors are not the same person, meet with their daily supervisor more often than with their first supervisor. Weekly meetings with the daily supervisor slightly decreased compared to 2019. Overall, the frequency of meetings with the daily supervisor increases as the project progresses, while meetings with the first supervisor decrease.

Similar to 2019, the relationship with the daily supervisor is considered good to very good and slightly better than with the primary supervisor. The daily supervisor scored slightly better than the primary supervisor concerning availability and academic and personal support. For support to become an autonomous researcher, the scores did not differ between the two types of supervisors.

The perceived availability of the first supervisor differed more across groups than the perceived availability of the daily supervisor. PhD students from GSH, GSEB and GSSS were most positive about their supervision. First-year PhD students felt more academically supported than did senior PhD students. This difference was especially visible for the first supervisor and less for the daily supervisor, which was also the case in 2019. Compared to other Graduate Schools, we see that PhD students from GSL were most positive about the personal support and autonomy they receive from both their supervisors, while PhD students from the GSCF were the least satisfied with the availability, support and autonomy granted by their supervisors.

Overall, academic and informal relationships with colleagues and sense of belonging in the department scored moderately and differences between groups were present. Informal relationships increased with phase.

7 Employment conditions

The first part of this chapter concerns information provision with regard to employment or scholarship conditions. These questions were only presented to first-year employed PhD students (VSNU type 1a) and PhD students on a full scholarship from UG/UMCG (VSNU type 2a). The second part of the chapter concerns the importance of certain rights and benefits associated with the employment conditions. These questions were presented to all PhD students, regardless of phase or student type.

Information about employment/scholarship conditions

First-year PhD students answered a number of questions for us to gain insight into how starting PhD students received information about their employment or scholarship conditions. As shown in Table 46, employed PhD students (type 2a, N = 118) mostly receive this information from either an appointment with HRM, during their job interview, the information package or the University website. PhD students on a full scholarship from UG/UMCG (type 2a, N = 64) obtain this information mainly from the PhD Scholarship Desk, the University website or the information package. These results are comparable to 2019.

Table 46 How did you find out about your employment/scholarship conditions, such as monthly payment, work hours, rights and duties?

Employed PhD students (1a)	N	%	PhD scholarship students (2a)	N	%
During my job interview	42	20.3	At my admission interview	22	9.6
An appointment with HRM	72	26.0	At the intake interview at the Graduate School	15	7.0
From my Graduate School	18	24.9	From the PhD Scholarship Desk	38	17.2
From the information package	42	28.2	From the information package	28	14.6
From the University's website	29	29.4	From the University's website	39	17.2
From my PhD guide	25	19.2	From my PhD guide	22	8.9
Other	27	17.5	Other	32	10.2
I did not receive any information	6	2.8	I did not receive any information	10	3.2
I do not remember	8	4.0	I do not remember	13	2.5

Almost 80% (79%) of the first-year employed PhD students (type 1a) felt that they were given sufficient information, which is comparable to 2019. Of the 22% that missed out on information, this concerned the information being very general, while others missed out on information about IT facilities (such as leave hour portal and online meetings).

Of the first-year PhD scholarship students (type 2a), 80% felt that they were given sufficient information; however, 20% indicated that they would have liked the differences between employee status and PhD scholarship student status to have been explained better beforehand and the information to have been more detailed.

Problems due to insufficient information

Those PhD students (N = 57) who indicated that they did not receive sufficient information, were asked whether they experienced problems due to this. Three quarters of the PhD students with employment status and 60% of the PhD scholarship students did not experience problems due to insufficient information. If there were problems, these concerned the following aspects for both groups: missing information on administrative obligations/possibilities (holiday or sick leave; Covid-19 benefits; 30% tax rule), missing or confusing information on the requirements and conditions of the position, problems with residence (declaring residence; residence permit). For PhD scholarship students, an additional problem was mentioned, namely that the website with the scholarship conditions was unavailable after the recruitment period. This is an interesting response because the information on the website was available all along, and it was improved in 2019 after a discussion with the University Council. It may be a signal, though, that the structure of the website is still not yet clear enough.

Rights and benefits

All PhD students were asked to share their opinion regarding the importance of, and their satisfaction with, certain rights and benefits as a PhD student. The importance of each right or benefit was scored on a five-point scale ranging from 'not important at all [1]' to 'very important [5]'. As displayed in Table 47, PhD students indicated that most of the rights and benefits are important to very important to them. In particular, having a regular monthly income, having good conditions regarding sick leave and maternity leave, and the freedom to make their own choices in the project are important conditions for PhD students. A good range of sports facilities and the opportunity to undertake an internship at a company or government organization were not considered very important. These results are comparable to those of 2019.

Table 47   **The importance of rights and benefits**

Rights and benefits	M	Sd
1. Having a regular monthly income	4.8	0.5
2. Having good conditions regarding sick leave and maternity leave	4.6	0.7
3. Having the freedom to make my own choices in my project	4.4	0.7
4. Having flexible working hours	4.3	0.8
5. Receiving a holiday allowance (i.e. the equivalent of one month's pay, paid out in May)	4.2	0.9
6. Having a pay rise every year	4.1	0.9
7. Receiving an end-of-year bonus (i.e. the equivalent of one month's pay, paid out in December)	4.1	1.0
8. Having access to a good range of health facilities, including mental health services	4.0	1.1
9. Being able to go abroad to do research at another university	3.7	1.1
10. Being allowed to teach and supervise Bachelor's and Master's students	3.6	1.1
11. Being able to follow an internship at a company or government organization	3.3	1.2
12. Having access to a good range of sports facilities	3.3	1.3

Group differences

Table 48 presents the extent to which the types of PhD students differ in their opinions regarding the importance of rights and benefits. The most pronounced differences are between PhD students who are paid partly or fully by UG/UMCG (types 1a, 1b, 2a and 2b) and those who are externally paid (type 3) or are external PhD students (type 4).

Table 48   The importance of rights and benefits, by type of PhD student

VSNU PhD type	1a (n=496)	1b (n=24)	2a (n=243)	2b (n=203)	3 (n=81)	4 (n=73)	max dif
1. Having a regular monthly income	4.9	4.7	4.9	4.8	4.8	4.4	0.5
2. Having a pay rise every year	4.1	3.8	4.3	4.3	3.8	3.5	0.8
3. Receiving a holiday allowance.	4.2	4.1	4.3	4.2	4.1	3.7	0.6
4. Receiving an end-of-year bonus	4.1	4.0	4.3	4.2	3.8	3.5	0.8
5. Having good conditions regarding sick leave and maternity leave	4.6	4.8	4.7	4.6	4.5	4.2	0.6
6. Having access to a good range of sports facilities	3.1	3.1	3.3	4.1	2.8	2.8	1.3
7. Having access to a good range of health facilities. including mental health services	3.9	3.8	4.2	4.5	3.6	3.7	0.9
8. Having the freedom to make my own choices in my project	4.4	4.5	4.3	4.4	4.4	4.6	0.3
9. Having flexible working hours	4.3	4.6	4.2	4.3	4.4	4.4	0.4
10. Being allowed to teach and supervise students	3.6	3.5	3.8	3.6	3.5	3.0	0.8
11. Being able to go abroad to do research at another university	3.6	3.6	4.0	4.1	3.3	3.5	0.8
12. Being able to follow an internship at a company or government organization	3.2	3.3	3.4	3.6	2.8	2.8	0.8

Abbreviation: *1a = employed PhD student, 1b = employee in PhD track, 2a = PhD student on UG/UMCG scholarship, 2b = PhD student on other scholarship, 3 = externally funded PhD student, 4 = external PhD student.*

Note: *Green indicates the highest scale score in a group, red indicates the lowest score in the case of the maximum difference being statistically significant.*

Satisfaction with rights and benefits

PhD students were asked to respond to statements regarding their satisfaction about some of these rights and benefits. The statements were phrased, 'I am satisfied with …', and the PhD students could respond on a five-point scale ranging from completely disagree [1] to completely agree [5]. All statements were presented to all PhD students except external PhD students (type 4), who did not see items 1, 3, 6 and 7. As shown in Table 49, PhD students are most satisfied with the topic of their research and the extent to which they can realize their own ideas. Regarding the other rights and benefits, they often answer neutral [3] or satisfied [4].

Table 49   Average satisfaction regarding rights and benefits

I am satisfied with my…	N	Mean	Sd
1. … income	1049	3.7	1.1
2. … research budget	1041	3.7	1.0
3. … conditions regarding sick/maternity leave	951	3.8	1.0
4. … topic of PhD research	1119	4.4	0.8
5. … extent execute own ideas	1119	4.2	0.9
6. … sport facilities	817	3.5	0.9
7. … health facilities	842	3.6	0.9
8. … quality of PhD thesis	973	3.9	0.9

Group differences

Significant differences were found regarding income, budget, leave conditions, the topic of the PhD, the extent to which they can realize their own ideas and health facilities (see Table 50). PhD students on a full cholarship from UG/UMCG (2a) were significantly less satisfied with their income and leave conditions than employed PhD students (1a and 1b). While the first might be related to the fact that they do not receive bonuses and pension contributions, the perception about leave is an interesting finding, since the conditions regarding sick leave and maternity leave are exactly the same for all groups (Jongbloed, Kaiser, Kottmann, 2019).[4] Apparently, the provision of information on these aspects is not yet sufficient. External PhD students are significantly less satisfied with their research budget than other types of PhD students, which makes sense as they often don't have any funding. These results are similar to 2019. In addition, PhD students on a scholarship other than that of UG/UMCG (type 2b) were significantly less satisfied with the topic of their PhD research and access to health facilities.

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4   Jongbloed, B., Kaiser F., Kottmann A. (2019). Het experiment Promotieonderwijs: een tussenevaluatie. CHEPS, Universiteit Twente. Retrieved via https://www.rug.nl/education/phd-programmes/phd-scholarship-programme/about/interim-evaluation-experiment-may-2019.pdf

Table 50 Mean satisfaction with the following rights and benefits, total and per affiliation group

VSNU PhD type	1a (n=496)	1b (n=24)	2a (n=243)	2b (n=203)	3 (n=81)	4 (n=73)	max dif
1. Income	4.2	4.2	2.8	3.5	4.1		0.4
2. Budget	4.0	3.5	3.6	3.5	3.7	3.1	0.9
3. Conditions	4.1	4.3	3.4	3.7	4.0		0.9
4. Topic	4.5	4.5	4.5	4.1	4.5	4.4	0.4
5. Own ideas	4.2	4.3	4.2	4.1	4.4	4.2	0.3
6. Sport facilities	3.5	3.8	3.4	3.6	3.6		0.4
7. Health facilities	3.4	3.6	3.2	3.4	3.3		0.4
8. Qualtity	3.7	3.7	3.9	3.8	3.8	3.9	0.2

Abbreviations: *1a = employed PhD student, 1b = employee in PhD track, 2a = PhD student on UG/UMCG scholarship, 2b = PhD student on other scholarship, 3 = externally funded PhD student, 4 = external PhD student. Green indicates the highest scale score in a group, red indicates the lowest score in the case of the maximum difference being statistically significant.*
Note: *Green indicates the highest scale score in a group, red indicates the lowest score in the case of the maximum difference being statistically significant.*

Chapter conclusion

Questions about information provision concerning employment/scholarship conditions were only presented to first-year employed PhD students (1a) and PhD scholarship students (type 2a). Most employed PhD students receive relevant information at their HRM appointment or job interview, while most PhD scholarship students mention the PhD Scholarship Desk for this. The majority (80%) of both groups felt sufficiently informed.

All PhD students answered questions about the importance of and satisfaction with their rights and benefits. Having a regular monthly income, good conditions regarding sick leave and maternity leave, and the freedom to make their own choices in the project were the most important. Overall, PhD students were moderately/highly satisfied with their conditions. PhD scholarship students were significantly less satisfied with their income.

8 Evaluations

This chapter first considers the formal evaluations, namely the go/no go moment (usually between 9-12 months after the start) and the yearly evaluation. Second, the presence and content of the Training and Supervision Plan is examined. Finally, scientific requirements of the thesis and its defence are considered.

Formal go/no go interview

Nine months after the start of their PhD project, PhD students should have a go/no go interview. This interview should be preceded by an informal interview at six months. Of the PhD students, 52% indicated that they had their go/no go interview nine months after the start of their PhD project, while 16% had this interview after twelve months (35% and 21% resp. in 2019). See Table 51 for all responses.

Table 51 Did you have a formal go/no go interview?

Answer	N	%
1. Yes, nine months after the start of my PhD project	589	52.4
2. Yes, twelve months after the start of my PhD project	179	15.9
3. Yes, at another time	52	4.6
4. No, but I will have one in the future	191	17.0
5. No	100	8.9
6. Other	12	1.1
Total	1123	100.0

Group differences
Figure 23 shows the distribution over three simplified answer categories. Employed PhD students (1a) and scholarship PhD students (2a and 2b) most often had their go/no go interview nine months after the start of the PhD project. This is less common for employees in a PhD track (1b) externally funded (3) and external (4) PhD students. Of the PhD students beyond their first year, 12% of intermediors and 20% of seniors had not had a go/no go interview. For the intermediors, this mainly concerned external PhD students (39%), externally funded PhD students (41%) and employees in a PhD track (19%). No PhD student type differences were present in the senior group. The highest proportion of PhD students who had not had a go/no go interview were found at the GSBSS (N = 92, 16%).
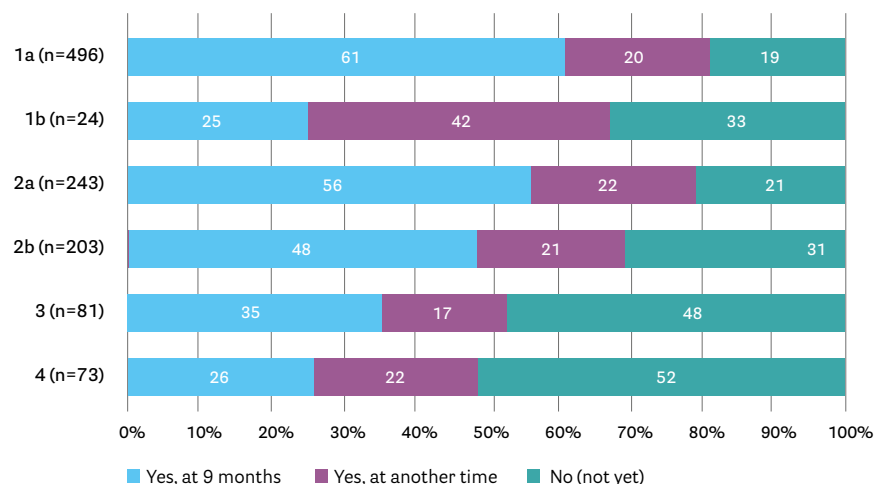
Figure 22 Did you have a formal go/no go interview? (presented by PhD student type).

Abbreviation: *1a = employed PhD student, 1b = employee in PhD track, 2a = PhD student on UG/UMCG scholarship, 2b = PhD student on other scholarship, 3 = externally funded PhD student, 4 = external PhD student*

PhD students who indicated they had had a go/no go interview (N = 820) were asked to indicate who was present (see Table 52). In almost all interviews, the primary supervisor was present (96%) and in those cases where the primary supervisor was absent, the daily supervisor was present. These results are comparable to 2019.

Table 52 Who was present at your go/no go interview? (multiple answers allowed)

Answer	N	%
1. Primary supervisor(s)	789	96.2
2. Daily supervisor(s)	540	65.9
3. Graduate School delegate	102	12.4
4. Human Resources representative	9	1.1
5. Someone else	50	6.1
Total	820	

Results and Development (R&D) interview

At least once a year, PhD students should have an interview about their progress ('R&D interview'). Therefore, PhD students who were beyond their first year were asked whether they had had an annual evaluation interview. Over three quarters indicated that they had (77%), while 3% had not (see Table 51). These percentages slightly differ from those of 2019 (64% and 6% resp.).

Table 53 Is your performance evaluated at least once a year?

Answer	N	%
1. Yes, I have a Results and Development (R&D) interview every year (also known as 'Jaargesprek' at the UMCG)	534	63.0
2. Yes, I have an annual interview/evaluation (this is not an R&D or I don't know if this is an R&D)	114	13.5
3. No, my performance is not evaluated on a regular basis	120	14.2
4. No, my performance has not been evaluated yet	25	3.0
5. I don't know	54	6.4
Total	847	100.0

Group differences

To be able to compare Graduate Schools, the first two categories were combined into the category, 'Yes, I have a Results and Development (R&D) interview every year'. As presented in Figure 23, PhD students from GSEB (95%) most often had an annual performance interview. Over 80% of PhD students from GSSS and GSMS had an annual interview. As in 2019, again less than 40% of the PhD students from the GSCF and GSH had an annual performance evaluation. At GSL the percentage was also low (56%), although this was an increase compared to 2019. In addition, a relatively high percentage of PhD students in the three latter mentioned Graduate Schools did not know if their performance had been evaluated
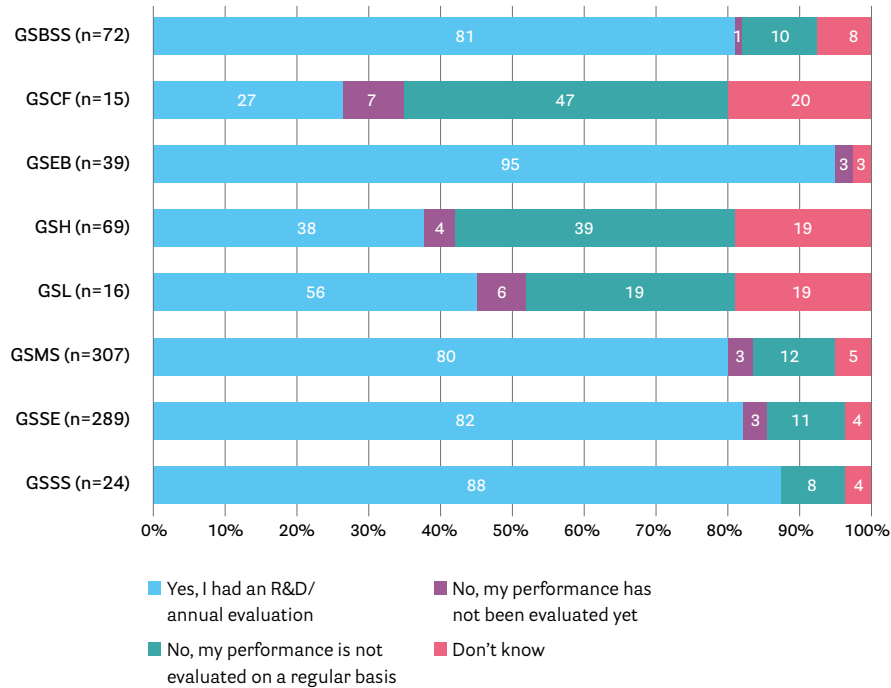
Figure 23 Is your performance evaluated at least once a year?

Acronyms: *GSBSS = Graduate School of Behavioural and Social Sciences, GSCF = Graduate School of Campus Fryslân, GSEB = Graduate School of Economics and Business, GSH = Graduate School of Humanities, GSL = Graduate School of Law, GSMS = Graduate School of Medical Sciences, GSSE = Graduate School of Science and Engineering, GSSS = Graduate School of Spatial Sciences*

Figure 24 shows that nearly 80% of both employed PhD students (1a) and PhD scholarship students (2a) had an annual performance evaluation. However, less than half of the external PhD students were evaluated.
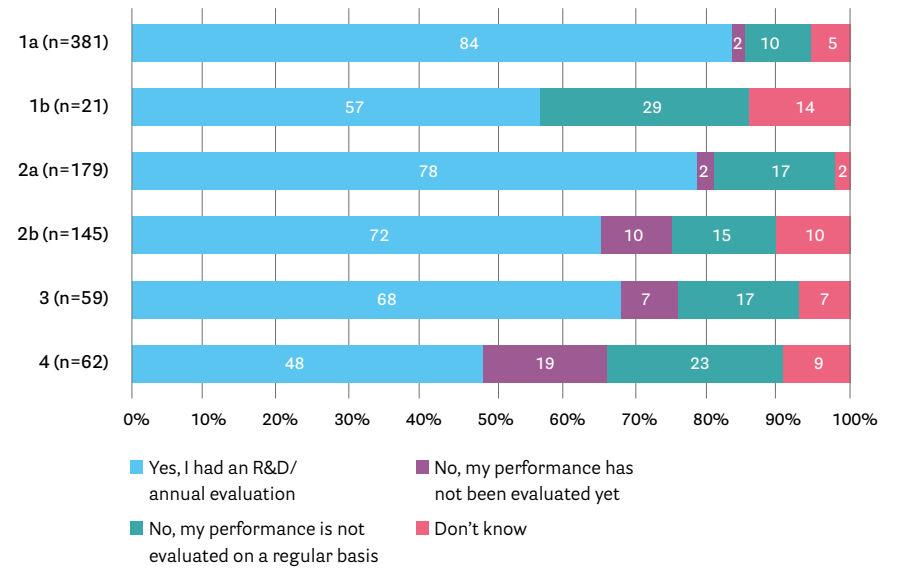
Figure 24 Is your performance evaluated at least once a year? (presented by PhD student type).

Abbreviation: *1a = employed PhD student, 1b = employee in PhD track, 2a = PhD student on UG/UMCG scholarship, 2b = PhD student on other scholarship, 3 = externally funded PhD student, 4 = external PhD student*

PhD students who had had an annual performance evaluation interview (N = 648) were asked who was present at their latest interview. As presented in Table 54, 95% indicated that their primary supervisor was present and 65% indicated that their daily supervisor was present. These percentages increased slightly compared to 2019 (91% and 61% resp.).

Table 54 Who was present at latest Results and Development (R&D) or annual interview/evaluation

Answer	N	%
1. Primary supervisor(s)	618	95.4
2. Daily supervisor(s)	424	65.4
3. Graduate School delegate	102	15.7
4. Human Resources representative	9	1.4
5. Someone else	28	4.3
Total	648	

Training and Supervision Plan

Before starting a PhD project, a PhD student and their supervisors should draw up a Training and Supervision Plan (TSP), as stated in the UG PhD regulations (2018). Three months after the start of the PhD programme at the latest, a fully completed TSP should be submitted to the Graduate School. The 2021 survey shows that over 90% (N = 1053, 94%) of the PhD students had a TSP. This percentage has increased compared to 2019 (77%) and 2017 (74%). The percentage of PhD students who do not know if they have a TSP has dropped from 8% in 2019 to 2% (N = 25) in 2021.

PhD students who have a TSP were asked how many months after the start of their PhD their TSP was formalized. For 72%, the TSP was formalized within three months (see Table 55). For 26% of these PhD students, this was before the start, for 11% it was formalized at the start and for 26% the TSP was formalized between one and three months after the start. These results are comparable to 2019.

Table 55   **How many months after the start of your PhD was your TSP formalized?**

Answer	N	%
1. Before start	271	25.7
2. At start	117	11.1
3. Within one month	103	9.8
4. Within three months	268	25.5
5. Within one year	173	16.4
6. I don't know/remember	121	11.5
Total	1053	100.0

PhD students who had a TSP were asked what kind of elements are described in it. Figure 24 displays the presence of different elements for the last four biennial PhD survey results. Over the years, about 10% could not name any elements. Compared to 2019, the most pronounced difference is the increase in descriptions of teaching activities and planning.
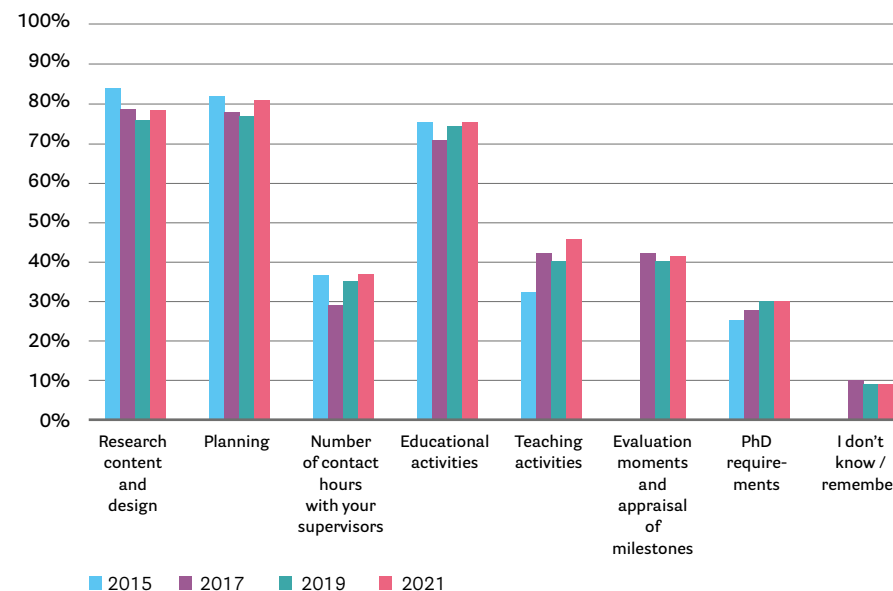
Figure 25   **Elements included in the TSP, results from surveys in 2015, 2017, 2019 and 2021.**

Group differences

Figure 26 shows the percentage of PhD students who have a TSP by Graduate School. Most Graduate Schools have a greater, slightly greater or similar percentage of PhD students who have a TSP compared to previous years. For GSMS, the percentage increased significantly (from 50% in 2019 to over 90% in 2021). There was no increase for GSL, which has the lowest percentage of PhD students with a TSP (78%). For 2021, only the differences between GSL and GSSE/GSEB were statistically significant.
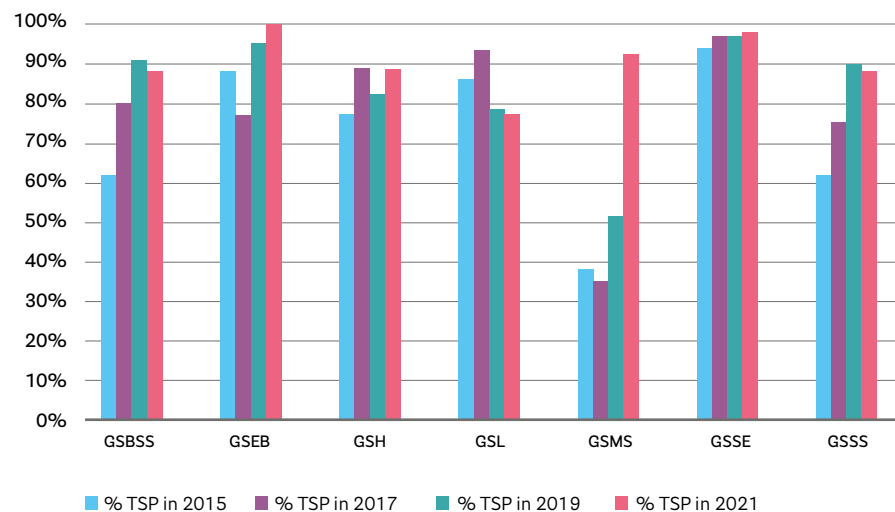
Figure 26 **Percentage of PhD students with a TSP in 2015, 2017, 2019 and 2021,**
                by Graduate School

Acronyms: *GSBSS = Graduate School of Behavioural and Social Sciences, GSEB = Graduate*
School of Economics and Business, GSH = Graduate School of Humanities, GSL = Graduate School of Law,
GSMS = Graduate School of Medical Sciences, GSSE = Graduate School of Science and Engineering,
GSSS = Graduate School of Spatial Sciences. Only Graduate Schools with at least 15 respondents are
included in the graph.

As shown in Table 56, over 95% of employed PhD students (1a) and scholarship PhD students
(2a and 2b) have a TSP. For 1a and 2a/b[5] these percentages increased compared to 2019 (84%
and 78% resp.). A TSP is less present in types 3 and 4, although the proportion has increased
compared to 2019 (around 60%). A relatively large proportion of external PhD students said
that they did not know if they had a TSP (7% vs 0-2% in the other groups).

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5   In 2019 no distinction between 2a and 2b was made.

Table 56   **Number and percentage of PhD students who say they have a TSP, by PhD student type**

VSNU PhD student type	N	%
1a. Employee	496	95.2
1b. Employed in PhD track	235	87.5
2a. UG/UMCG scholarship	197	96.7
2b. Other scholarship	72	97.0
3. Externally financed	81	88.9
4. External	73	72.6

Regular update and satisfaction with TSP

PhD students who have a TSP and were beyond their first year were asked whether their TSP
was updated at least once a year. Of the PhD students who answered this question (N = 785),
only 24% indicated that their TSP is updated annually, while 62% said this was not the case.
The remaining 14% chose the answer option, 'Not yet applicable'. These results are comparable
to 2019.

Table 57 shows to what extent PhD students are satisfied with the TSP, based on five statements
that they had to score on a five-point scale (from completely disagree [1] to completely agree
[5]). Overall, the PhD students were neutral to satisfied (M = 3.3), which is comparable to the
findings of two years ago. The other statements range from between 2.9 and 3.7 (also similar to
two years ago), implying that PhD students generally have a neutral opinion about their TSP.

Table 57   **Satisfaction with TSP**

Statement	N	M	Sd
1. My TSP serves as a good guideline for my time as a PhD student	775	2.9	1.2
2. Drawing up a TSP helped me to plan my PhD project	770	3.0	1.2
3. I can revise my TSP when necessary	748	3.7	1.0
4. My TSP is evaluated regularly during my R&O or annual interview/ evaluation	730	2.9	1.3
5. Overall, I am satisfied with my TSP	771	3.3	1.0

Group differences

As shown in Table 58, the maximum difference between Graduate Schools on each of the
items is considerable (ranging from 0.5 to 1.1 on a five-point scale), with the GSCF and GSBSS
scoring the lowest on three out of five items. Significant differences were found for statements
1, 2, 4 and 5 between Graduate Schools with the highest and lowest scores. Results are
comparable to 2019.

Table 58 Satisfaction with the TSP, presented by Graduate School

	N	1. My TSP serves as a good guideline for my time as a PhD student		2. Drawing up a TSP helped me to plan my PhD project		3. I can revise my TSP when necessary		4. My TSP is evaluated regularly during my R&O or annual interview/ evaluation		5. Overall, I am satisfied with my TSP	
		Mean	Sd	Mean	Sd	Mean	Sd	Mean	Sd	Mean	Sd
GSBSS	58	2.5	1.1	2.7	1.1	3.6	1.1	2.4	1.2	3.0	0.9
GSCF	15	2.5	1.4	3.2	1.3	4.1	0.6	2.0	1.0	2.8	1.2
GSEB	34	3.0	1.3	2.8	1.3	3.8	1.2	3.2	1.3	3.4	1.0
GSH	50	2.7	1.1	3.2	1.1	3.7	0.8	2.7	1.2	3.4	0.9
GSMS	256	2.8	1.1	2.8	1.2	3.7	1.0	2.9	1.2	3.2	1.0
GSSE	241	3.1	1.2	3.1	1.2	3.7	1.0	3.1	1.3	3.4	1.1
GSSS	20	3.1	1.1	3.5	1.1	3.9	1.0	2.9	1.3	3.4	0.9
Max dif		0.6		0.8		0.5		1.2		0.6	

Acronyms: *GSBSS = Graduate School of Behavioural and Social Sciences, GSCF = Graduate School of Campus Fryslân, GSEB = Graduate School of Economics and Business, GSH = Graduate School of Humanities, GSL = Graduate School of Law, GSMS = Graduate School of Medical Sciences, GSSE = Graduate School of Science and Engineering, GSSS = Graduate School of Spatial Sciences. Only Graduate Schools with at least 15 respondents are included in the table.*
Note: *Green indicates the highest scale score in a group, red indicates the lowest score in the case of the maximum difference being statistically significant.*

The differences between affiliation type are shown in Table 59. The differences (ranging from 0.6 to 0.8) between the groups are again significant for statements 1, 2, 4 and 5 for the high and low scoring PhD student types. In 2019, significant differences were found for all five items. PhD students with a scholarship other than one from UMCG/UG were most satisfied with their TSP, while those on a UG/UMCG scholarship scored the lowest for three out of four items.

Table 59 Satisfaction with the TSP, presented by PhD student type

	N	1. My TSP serves as a good guideline for my time as a PhD student		2. Drawing up a TSP helped me to plan my PhD project		3. I can revise my TSP when necessary		4. My TSP is evaluated regularly during my R&O or annual interview/ evaluation		5. Overall, I am satisfied with my TSP	
		Mean	Sd	Mean	Sd	Mean	Sd	Mean	Sd	Mean	Sd
1a	322	2.7	1.1	2.8	1.2	3.6	1.0	2.9	1.3	3.2	1.0
1b	16	2.8	1.1	2.7	1.1	3.6	1.0	2.6	0.9	3.2	1.3
2a	157	2.7	1.2	2.8	1.2	3.7	0.9	2.8	1.3	3.1	1.1
2b	121	3.5	1.1	3.7	1.0	3.9	1.0	3.6	1.1	3.7	1.0
3	45	2.8	1.2	3.1	1.0	3.7	1.0	2.7	1.1	3.1	1.1
4	33	2.8	1.1	3.0	1.2	3.9	0.8	2.7	1.2	3.3	1.2
Max dif		0.8		1.0		0.3		1.0		0.6	

Note: *Green indicates the highest scale score in a group, red indicates the lowest score in the case of the maximum difference being statistically significant.*

Scientific requirements of the thesis

All PhD students were asked if they discussed the scientific requirements (e.g. the content of their thesis, how many research chapters should be submitted as articles and about scientific integrity) of their PhD thesis and with whom. Their responses are shown in Table 58. Almost 65% had discussed the requirements with one of their supervisor(s), while 17% had not yet discussed this topic.

Table 60 Have you discussed the scientific requirements of your thesis? (multiple responses allowed)

Answer	N	%
1. Yes, with (one of) my supervisor(s)	720	64.1
2. Yes, with other people (e.g. PhD counsellor of Graduate School)	66	5.9
3. Yes, with my supervisor(s) and other people	331	29.5
4. No, I have not discussed the academic requirements with anyone (yet)	196	17.4

The PhD students (n = 920) who had discussed the scientific requirements with someone were asked if the requirements were clear to them. Table 59 shows that this was the case for the majority, as three quarters stated that the requirements were clear to very clear; less than 5% of the PhD students thought the requirements were rather unclear or very unclear. PhD students in their first year more often have not discussed the requirements, compared to intermediors and seniors (32% vs 15% and 10% resp.). These results are comparable to those of 2019.

Table 61   **Are the scientific requirements clear to you?**

Answer	N	%
1. Very clear	262	28.5
2. Rather clear	440	47.8
3. A bit clear	179	19.5
4. Rather unclear	33	3.6
5. Very unclear	6	0.7
Total	920	100.0

Finishing the PhD project

Questions related to the completion of the PhD project were only presented to senior PhD students (who indicated a start date that was at least three years prior to the date at which they started the survey). The first question concerned the time period in which they expect to submit their thesis manuscript to the assessment/reading committee. For about one quarter, no time frame could be calculated. Dates were divided into five time frames, displayed in Table 62.

Table 62   **When do you expect to submit the manuscript of your thesis to the assessment/ reading committee?**

Time period	N	%
< 3 months	389	46.2
Between 3–12 months	130	15.4
Between 12–24 months	294	34.9
Between 24–36 months	24	2.9
>36 months	5	0.6
Total	842	100.0

Information about the thesis defence

Intermedior and senior PhD students (N = 842) were asked whether and where they searched for information about the procedures and requirements for their thesis defence. As shown in Table 63, a little over one third searched for information (N = 300, 36%), of which 4% could not find the information. This percentage seems low as 389 PhD students indicated they would submit their manuscript to the reading committee within three months (Table 62).

Table 63   **Have you searched for information about the procedures and requirements for the thesis defence?**

Answer	N	%
1. Yes	263	31.2
2. Yes, but I could not find them	37	4.4
3. No, but I will do this soon	310	36.8
4. No, this is not yet relevant to me	232	27.6
Total	842	100.0

Almost three quarters (73%) of the 263 PhD students who were able to find information stated that the information was quite/very clear to them. As shown in Figure 27, the most important sources of information are fellow PhD students (33%), the UG website and supervisors (both 31%), the PhD Guide (24%) and the Graduate School website (20%). These results are similar to 2019. Six students mentioned the workshop 'Defence in sight', organized by SHARE.
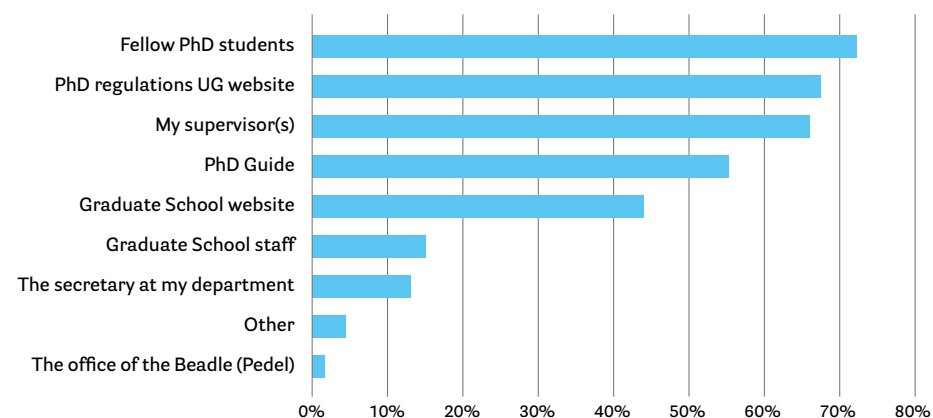
Figure 27   **Where did you search for information, or whom did you ask about the procedures and requirements for the thesis defence?**

Chapter conclusions

Nine months after the start of their PhD project, PhD students should have a go/no go interview. This interview should be preceded by an informal interview at six months. Invitations for these interviews are sent out automatically from Hora Finita. On average, about half of the PhD students report having had an evaluation interview around nine months after the start. A timely interview is most common for employed PhD students (VSNU type 1a) and scholarship PhD students (VSNU type 2a and 2b) and less common for employees in a PhD track (VSNU type 1b), externally funded (VSNU type 3) and external PhD students (VSNU type 4).

At least once a year, PhD students should have an interview about their progress ('R&D interview'). Over three quarters of the PhD students beyond their first year had this annual performance interview which is an increase of 13% compared to 2019 (64%).

A Training and Supervision Plan (TSP) should be drawn up before the start of a PhD project or within the first three months of it. This year, over 90% of the PhD students has a TSP, which is a substantial increase compared to previous years (2019: 77%; 2017: 74%). A TSP was the least often held by employees in a PhD track, externally financed PhD students and external PhD students. Similar to 2019, one quarter of the PhD students beyond their first year indicated that their TSP is updated annually. Several elements are described in the TSP, with the most pronounced difference compared to previous years being an increase in the inclusion of teaching activities and planning.

9 Educational activities

Alongside completing their PhD thesis work, PhD students are recommended to earn ECTS[6] by performing educational activities, for example by following courses. For PhD scholarship students (with a full or top-up scholarship from UG/UMCG), following a training programme with a certain number of ECTS is a mandatory requirement to receive the scholarship. Most educational activities that PhD students attend are organized by the Graduate Schools, but other institutes or organizations may also provide educational modules or individual training. We asked to what kind of activities PhD students had access, if courses were obligatory and how many courses PhD students had attended.

ECTS to complete the PhD trajectory

If PhD students have a project of four years, they are generally recommended or required to earn 30 ECTS. A little over 800 PhD students (N = 816, 73%) answered the question, 'How many ECTS do you need to earn within your PhD project in order to complete it?' The average number of ECTS to be earned was 23.4 ECTS (Sd = 25.4). Of the PhD students, 8% reported they were under no obligation to earn ECTS and 20% did not know how many they need to complete their PhD. ECTS were divided into five categories, of which the percentages are displayed in Table 64.

Table 64 Number of ECTS to be earned to complete PhD trajectory

ECTS	N	%
< 15	125	15.3
16-30	585	71.7
31-45	86	10.5
46-60	10	1.2
> 60	10	1.2
Total	816	

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6   European Credit Transfer and Accumulation System

Fewer PhD students answered the follow-up question (N = 733, 71%), 'How many ECTS have you earned so far? The average number of ECTS earned was 29.6 (Sd = 20.3), while 3% had not earned any ECTS and 26% did not know.

Group differences
Differences with regard to the amount of ECTS to be earned to complete the PhD trajectory were examined for PhD student types and Graduate Schools. For PhD student type, no differences were found. PhD students from GSSS reported a significantly lower number of ECTS, namely 18, compared to the other Graduate Schools (see Table 65).

Table 65   *Average ECTS to be earned to complete PhD trajectory by Graduate School*

Graduate School	N	Mean	SD
Behavioural and Social Sciences	37	28.0	10.1
Campus Fryslân	20	28.6	6.3
Economics and Business	35	31.3	15.0
Humanities	61	30.0	9.4
Medical Sciences	295	29.8	31.8
Science and Engineering	322	30.6	6.0
Spatial Sciences	30	18.3	14.0

Note: *Only Graduate Schools with at least n = 15 respondents are displayed*

Access to educational activities

Table 66 shows that a large majority (76%) indicated they had access to discipline and general (e.g. project management, writing and presentation) skills-related activities and to seminars and conferences. Almost 60% said they had access to career orientation activities and almost 45% to teacher training activities.

A small proportion (3%) indicated they had no access to any of the education activities presented – this mainly concerned scholarship PhD students (VSNU type 2a, 5%) and external PhD students (VSNU type 4, 8%). The UG policy is that all PhD students, of any type and Graduate School, should have access to the teacher training programme, but obviously not all PhD students (and perhaps also supervisors) are aware of this.

Table 66   **To which education activities do you have access? (multiple answers allowed)**

Answer	N	%
1. Discipline-specific courses and workshops	848	75.5
2. General skills courses and workshops	993	88.4
3. Seminars and conferences	975	86.8
4. Teacher training activities	491	43.7
5. Career orientation activities	671	59.8
6. Other education activities	340	30.3
7. I don't have access to education activities	27	2.4
Total	1123	

Next, participation in obligatory courses (obligations may differ between Graduate Schools) as part of PhD educational training was examined. Almost 85% (N = 930, 83%) answered yes to the question of whether any courses are obligatory for them, and they were then asked which type of courses this concerned. The results are presented in Table 67. Courses that were most mentioned as obligatory are general skills (61%) and discipline-specific courses (36%).

Table 67   **Please indicate which type of courses are obligatory? (multiple answers allowed)**

Answer	N	%
1. Discipline-specific courses and workshops	405	36.1
2. General skills courses and workshops	682	60.7
3. Seminars and conferences	211	18.8
4. Teacher training activities	69	6.1
5. Career orientation activities	106	9.4
6. Other education activities	109	9.7
7. I don't know	36	3.2
Total	1123	

Attendance of educational activitie

PhD students were asked how often they attended educational activities. These were divided into 'Discipline-specific courses', 'Generic skills courses', 'Teacher training', 'Career orientation activities' and 'Conferences'. The results are presented in Table 68. It was found that 72% of the PhD students had not attended a teacher training course, while 53% had not attended any career orientation activities. These results are comparable to 2019.

Table 68   **How many of the following types of courses and activities have you attended during your PhD so far?**

Type of activity	None %	One %	Two %	Three or more %	Don't remember %
1. Discipline-specific courses	20.7	23.9	19.8	26.3	9.3
2. Generic skills courses	15.5	23.1	24.3	32.2	4.9
3. Teacher training activities	71.7	17.6	3.2	2.0	5.5
4. Career orientation activities	53.2	22.5	11.0	6.7	6.7
5. Conferences	17.4	18.4	16.7	44.2	3.4

Satisfaction with educational activities

PhD students were asked to indicate how much they agreed (on a five-point scale, ranging from completely disagree [1] to completely agree [5]) with statements regarding the educational activities that are offered. A scale score (α = 0.88) was calculated on the basis of all items. Similarly to two years ago, PhD students were moderately satisfied with the educational activities (M = 3.5). Table 69 shows that PhD students agreed most with the following statements, 'My supervisors encourage me to participate in courses, seminars, conferences and other education activities'. They agreed the least with statements that address the preconditions of the educational activities, such as, 'I have sufficient time to participate in educational activities' and 'I am satisfied with the information I receive about educational activities'. These results are the same as in 2019.

Table 69   **To what extent do you agree with the following statements about educational activities**

Statement	M	SD
1. I have sufficient time to participate in educational activities	3.4	1.0
2. I am satisfied with the number of educational activities on offer	3.5	0.9
3. I am satisfied with the quality of the educational activities on offer	3.6	0.9
4. I am satisfied with the diversity of the educational activities on offer	3.5	1.0
5. I am satisfied with the information I receive about educational activities	3.4	1.0
6. The educational activities in which I have participated contribute to the completion of my PhD	3.6	1.0
7. My supervisors encourage me to participate in courses, seminars, conferences and other education activities	3.8	1.0
8. In general, I am satisfied with the educational activities on offer	3.6	0.9
9. I am satisfied with the career orientation activities that are offered	3.4	1.0
Educational satisfaction scale score (α = 0.88)	3.5	0.7

Group differences

The extent to which PhD students were satisfied with the educational activities differed statistically between the Graduate Schools. The mean scores for each Graduate School are presented in Table 70. GSCF scored lowest (M = 3.2), while GSEB, GSSS and GSTRS scored highest (M = 3.7). The differences between these high and low scores are statistically significant.

Table 70   **Average scale score for satisfaction with educational activities scale by Graduate School**

Graduate School	N	Mean	Sd
Behavioural and Social Sciences	91	3.5	0.8
Campus Fryslân	21	3.2	0.7
Economics and Business (SOM)	52	3.7	0.6
Humanities	93	3.5	0.7
Law	23	3.6	1.0
Medical Sciences	370	3.5	0.6
Philosophy*	7	3.1	0.8
Science and Engineering	403	3.6	0.7
Spatial Sciences	34	3.7	0.8
Theology and Religious Studies*	10	3.7	0.4

GSP and GSTR are not included in statistical test for group differences

Chapter conclusion

A majority of PhD students have access to discipline and general skills-related (e.g. project management, writing and presentation) educational activities, seminars and conferences and career orientation activities. Less than half of the PhD students indicated they had access to teacher training activities. A small proportion (3%) indicated they had no access to any of the education activities presented – this mainly concerned external PhD students. Similarly to 2019, overall, PhD students were moderately satisfied with several aspects of their educational activities (e.g. information provisioning, sufficient time for participation, encouragement by supervisors and satisfaction with the activities). PhD students from the GSCF were the least satisfied, while those from GSEB, GSSE and GSTRS were the most satisfied about their education.

10 Career preparation

The UG stimulates PhD students to start exploring their options for their future careers from their first year onwards (Career Perspectives Series). This chapter concerns the role of the UG, Graduate Schools and supervisors in preparing PhD students for their future career, either inside or outside academia. PhD students were asked about their job prospects and preparation/ orientation activities, either inside or outside academia, or both.

Exploring future career

As shown in Table 71, 45% of the PhD students indicated that they have started exploring their career options, while 34% had not done so yet. These percentages are comparable to 2019. Clear differences were found depending on the phase. About 60% of the first-year PhD students indicated that they had not yet explored their options for a future career (which is an increase compared to 2019 [50%]), while 63% of the senior PhD students had explored their options. This difference with regard to phase is also visible in the answers of PhD students who have not yet explored their options for a future career (N = 386): 36% will do this in their second or second-to-last year and 49% will do this in their final year.

Table 71 Are you currently exploring options for a future career?

Answer	UG %	Starter %	Medior %	Senior %
1. Yes	44.8	23.4	43.4	63.3
2. No, not yet	34.4	58.8	38.6	9.6
3. No, I already know what I am going to do/ want to do after my PhD	14.7	13.9	11.9	19.2
4. No, I'll be/am working as a medical specialist	3.0	2.2	3.4	3.1
5. Not applicable	3.1	1.8	2.6	4.8

Acronyms: *UG = University of Groningen*

Career activity participation

PhD students were asked to indicate in what type of career activities they participated (multiple answers were allowed). The results are shown in Table 72. Of the PhD students, 59% (n = 622) indicated they had not participated in any of the activities listed. The activities in which the remaining 461 PhD students participated is displayed in Table 72. Of the 27 PhD students who selected the option 'Other', 13% mentioned the UG PhD day.

Table 72 **During your PhD track, did you participate in any of the following career activities? (multiple answers allowed)**

Answer	N	%
1. Guidance from the career centre	85	18.4
2. Career orientation course(s) and/or workshop(s) (such as job application training or LinkedIn workshop)	291	63.1
3. Job market/career event	130	28.2
4. Company visit or presentations by companies or alumni	99	21.5
5. Other activities	27	6.4
Total number of PhD students who participated in at least one activity	461	
6. I have not (yet) participated in activities	662	58.9

Participation in activities focused on a career inside or outside academia is displayed in Table 71. Participation did not significantly differ between events aimed at either of the career options.

Table 73 **During your PhD track, did you participate in any of the following career activities?**

	Inside		Outside	
Number of events	N	%	N	%
1. None	646	61.3	615	58.4
2. I don't know/remember	112	10.6	98	9.3
3. Attendance of one or more	296	28.1	340	32.3
– One	194		198	
– Two	73		88	
– Three or more	29		54	
Total	1054	100.0	1053	100.0

Support by the University of Groningen

PhD students were asked to state their agreement on a five-point scale (totally disagree [1] to totally agree [5]) regarding guidance by the University in their career preparation, the usefulness of their PhD topic and the skills, they acquired during their PhD. As shown in Table 74, PhD students agreed more with the statements regarding a career inside academia (ranging from 3.2 to 4.1) than outside academia (ranging from 3.0 to 3.7).

Table 74 **Agreement with statements regarding career preparation, both inside and outside academia**

	Inside			Outside		
Statement	N	Mean	Sd	N	Mean	Sd
1. In general, I am satisfied with the guidance that the University offers regarding career preparation inside/outside academia	907	3.2	0.8	880	3.0	0.9
2.The topic of my PhD research is useful for a future career inside/outside academia	1013	3.8	0.8	1001	3.4	1.0
3. The skills I am learning during my PhD trajectory are useful for a future career inside/outside academia	1019	4.1	0.7	1004	3.7	0.9

Group differences
Figure 38 shows small but significant differences between PhD student types on the statements presented in Table 74 regarding careers inside academia. The differences between the most satisfied and most dissatisfied groups are significant.
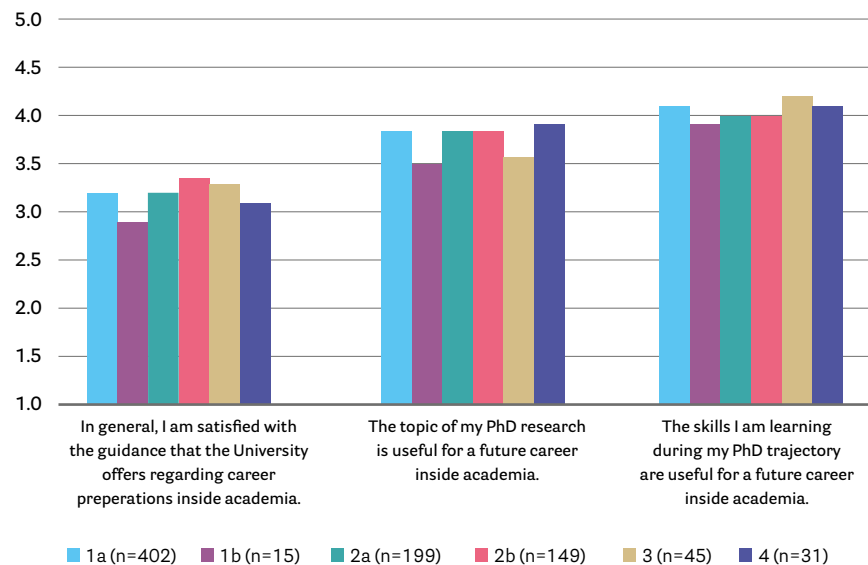
Figure 28 Agreement with statements regarding career preparation inside academia, presented by PhD student type.

Note: *1a: employed PhD student, 1b: employee in PhD track, 2a: PhD student on UG/UMCG scholarship, 2b: PhD student on other scholarship, 3: externally financed PhD student, 4: external PhD student*

Career Perspectives Series

The UG offers numerous career preparation courses. Of the PhD students who were exploring options for a future career, or will do so in the future (total N = 1054), 79% indicated that they were aware of these courses. This knowledge was related to phase, Graduate School and PhD student type, as shown in Table 75. The percentages in the table refer to the percentage of the PhD students of that particular group who were aware that the UG offers career training. For example, 88% of the PhD students of the GSBSS were aware, 73% of the external PhD students and 75% of the PhD students in their first year (starters) were aware.

Similarly to 2019, the lowest percentage of PhD students who were aware were in the GSMS (72%). Externally funded PhD students (type 3) were the least aware (66%), while PhD scholarship students (type 2a) were most aware (89%). The latter is to be expected, since the Career Perspectives Series was set up for the PhD scholarship students and they are obliged to follow parts of it.

Table 75 Do you know that the University of Groningen offers opportunities for career training (e.g. Career Perspectives Series)?

Graduate School	N	% Yes	PhD type	N	% Yes
GSBSS	75	88.2	1a	385	81.1
GSCF	21	100.0	1b	11	64.7
GSEB	43	87.8	2a	207	88.8
GSH	83	91.2	2b	131	67.5
GSL	19	90.5	3	51	66.2
GSMS	240	71.6	4	41	73.2
GSP	7	100.0	**Phase**	**N**	**% Yes**
GSSE	300	74.6	starter	196	74.5
GSSS	32	94.1	medior	362	77.8
GSTRS	8	88.9	senior	270	82.8

Acronyms: *GSBSS = Graduate School of Behavioural and Social Sciences, GSCF = Graduate School of Campus Fryslân, GSEB = Graduate School of Economics and Business, GSH = Graduate School of Humanities, GSL = Graduate School of Law, GSMS = Graduate School of Medical Sciences, GSP = Graduate School of Philosophy, GSSE = Graduate School of Science and Engineering, GSSS = Graduate School of Spatial Sciences, GSTRS = Graduate School of Theology and Religious Sciences*

Satisfaction with Career Perspectives Series

One of the main goals of the PhD Scholarship programme at the UG was to set up a programme for career orientation (Career Perspectives Series). In any of these activities, PhD scholarship students have the first right to participate (at reduced prices), but if there is still room, other PhD students can participate. We asked PhD students with a scholarship (types 2a and 2b) and who were exploring their future career, to what extent they agreed with, 'The career-orientation activities offered in the Career Perspectives Series (CPS) contribute to preparing me for my future career'. Of the 234 PhD students who answered this question, almost one fifth answered 'Not applicable' (19%). From this we can conclude that the question was presented to PhD students types other than 2a/2b. The routing to this question was based on answers in the affiliation-decision tree (see Appendix M). The overall agreement with the proposition was just above neutral (M = 3.3, SD = 0.84).

Support from the Graduate School

PhD students[7] were asked to what extent their Graduate School pays attention to career orientation and preparation in general, to a career inside academia and to a career outside academia. According to PhD students, the Graduate Schools pay more attention preparing them for a career inside academia compared to one outside academia. However, as shown in Figure 29, about 30% of the PhD students did not know the extent to which their Graduate School pays attention to preparing them for a career. The pattern presented in Figure 29 is comparable to the results obtained two years ago.
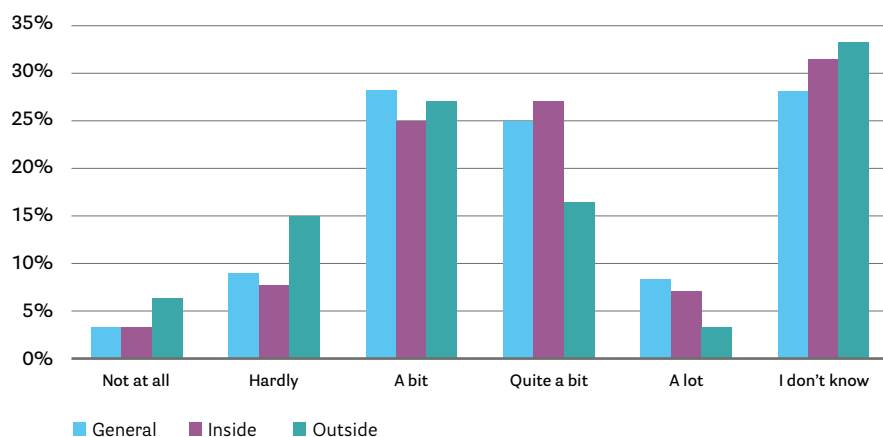
Figure 29 **To what extent does your Graduate School pay attention to preparing PhD students for a career in general, inside academia or outside academia?**

Group differences

An average score was calculated (without the answer option, 'I don't know'). A low score indicates no attention to career orientation and preparation by the Graduate School, while a higher score indicates a lot of attention. PhD students from GSCF and GSP were the least convinced that their Graduate School pays attention to career orientation/preparation, while PhD students from GSL, GSTRS and GSSE stated that their Graduate School does this a bit or quite a bit. Results for each Graduate School are shown in Table 76.

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7   Except medical specialists and PhD students who answered 'Not applicable' to the question, 'Are you currently exploring options for a future career?'

Table 76 **Average score for Graduate School attention to career orientation/preparation, in general and inside and outside academia**

	General		Inside		Outside	
	N	Mean	N		N	
UG	762	3.4	731	3.4	703	2.9
GSBSS	66	3.5	63	3.4	59	3.0
GSCF	21	2.6	21	2.5	20	2.2
GSEB	42	3.5	43	3.6	41	2.7
GSH	69	3.5	69	3.5	59	3.1
GSL	15	3.8	16	3.8	15	3.1
GSMS	231	3.3	220	3.4	223	2.9
GSP*	7	2.4	7	3.1	6	2.0
GSSE	273	3.5	258	3.4	246	3.1
GSSS	30	3.1	27	2.9	28	2.7
GSTRS*	8	3.8	7	3.6	6	3.0

Acronyms: *UG = University of Groningen, GSBSS = Graduate School of Behavioural and Social Sciences, GSCF = Graduate School of Campus Fryslân, GSEB = Graduate School of Economics and Business, GSH = Graduate School of Humanities, GSL = Graduate School of Law, GSMS = Graduate School of Medical Sciences, GSP = Graduate School of Philosophy, GSSE = Graduate School of Science and Engineering, GSSS = Graduate School of Spatial Sciences, GSTRS = Graduate School of Theology and Religious Sciences, *GSP and GSTRS were not included in statistical tests.*
Note: *Green indicates the highest scale score in a group, red indicates the lowest score in the case of the maximum difference being statistically significant.*
* GSP and GSTRS were not included in statistical tests.

Encouragement by and usefulness of network of supervisors

PhD students were asked to respond to two statements (on a five-point scale ranging from completely disagree [1] to completely agree [5]), regarding their supervisors' role in preparing them for a career inside and outside academia. As presented in Table 77, PhD students were more positive about the network of their supervisors and their supervisors encouragement regarding a career inside rather than outside academia. This is to be expected, since obviously the supervisors work inside academia. Activities focused on careers outside academia (as offered with the Career Perspectives Series) are therefore the more useful. PhD students agreed most with the statement, 'My first supervisor has a useful network that can help me to find a job inside academia' (M = 3.8). PhD students were, on average, neutral in their responses to the statements on encouragement by and the network of their supervisors outside academia. These results are comparable to 2019.

Table 77 Encouragement by and usefulness of network of first and daily supervisors inside and
outside academia

Statement	Inside academia			Outside academia		
	N	M	Sd	N	M	Sd
1. My first supervisor encourages me to orient myself towards a career	896	3.3	0.9	878	2.9	0.8
2. My daily supervisor encourages me to orient myself towards a career	661	3.3	0.9	648	2.9	0.8
3. My first supervisor has a useful network that can help me to find a job	924	3.8	1.0	896	3.1	1.0
4. My daily supervisor has a useful network that can help me to find a job	690	3.6	1.0	667	2.9	1.0

Group differences

Significant differences are present between the six PhD student types for two statements:
my daily supervisor encourages me to orient myself towards a career (2) and my supervisor has
a useful network that can help me find a job (4) for both inside and outside career preparation.
Figure 30 shows the differences for the statements presented for careers inside academia and
Figure 31 shows the differences related to careers outside academia. Differences with regard
to statements inside were significant between type 2b PhD students and the other groups;
differences with regard to the two statements outside were significant between types 3
and 2a/2b.
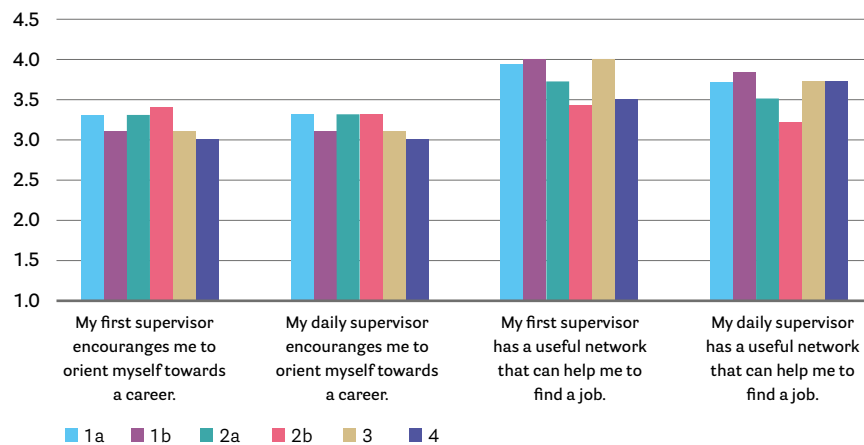
Figure 30 Encouragement by and usefulness of network of first and daily supervisors inside
academia, presented by PhD student type
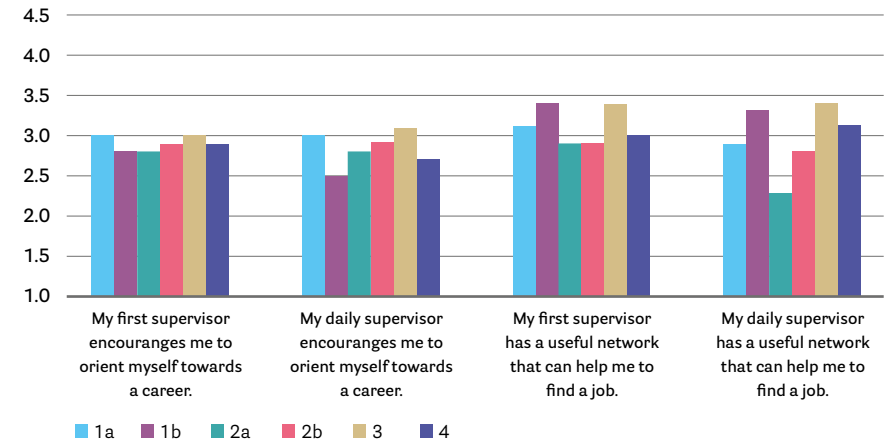
Figure 31 Encouragement by and usefulness of network of first and daily supervisors outside
academia, presented by PhD student type.

Abbreviation: *1a = employed PhD student, 1b = employee in PhD track, 2a = PhD student on UG/UMCG scholarship, 2b = PhD student on other scholarship, 3 = externally funded PhD student, 4 = external PhD student.*

Differences were also compared for the Graduate Schools. For three statements, significant
differences were present: encouragement by the daily supervisor regarding a career inside
academia and regarding the primary supervisor's network, both inside and outside academia.
Average scores for these statements are presented in Table 78. The difference between the
Graduate Schools with the highest and lowest scores were statistically significant.

Table 78 Average scores for significantly different statements between Graduate Schools

| Graduate School | Inside | | | | Outside | |
| | Encouragement daily supervisor | | Network primary supervisor | | Network primary supervisor | |
	N	score	N	Score	N	score
GSBSS	61	3.4	73	3.2	74	3.0
GSCF	18	3.4	18	3.4	19	2.6
GSEB	38	3.1	45	3.2	43	3.0
GSH	61	3.6	76	3.6	76	2.9
GSL	11	3.9	20	3.9	17	3.5
GSMS	214	3.2	287	3.2	294	3.2
GSP*	4	3.5	5	3.6	6	2.2
GSSE	226	3.3	335	3.2	332	3.0
GSSS	24	3.3	28	3.5	28	3.2
GSTRS*	4	3.0	9	3.4	7	2.9
Max. difference		0.9		0.7		0.6

Acronyms: *GSBSS = Graduate School of Behavioural and Social Sciences, GSCF = Graduate School of Campus Fryslân, GSEB = Graduate School of Economics and Business, GSH = Graduate School of Humanities, GSL = Graduate School of Law, GSMS = Graduate School of Medical Sciences, GSP = Graduate School of Philosophy, GSSE = Graduate School of Science and Engineering, GSSS = Graduate School of Spatial Sciences, GSTRS = Graduate School of Theology and Religious Sciences.*
Note: *Green indicates the highest scale score in a group, red indicates the lowest score in the case of the maximum difference being statistically significant.*
* GSP and GSTRS were not included in statistical tests.

Familiarity with career opportunities

PhD students indicated that they were more familiar with options in their field regarding a career inside academia than outside, as presented in Figure 32.
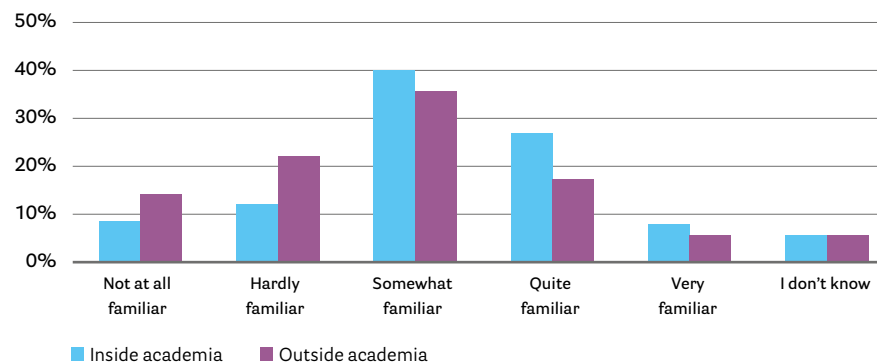
Figure 32 To what extent are you familiar with the options in your field regarding a career?

Group differences
To compare the differences between Dutch, EER (non-Dutch) and non-EER PhD students, an average score (excluding the option 'I don't know') was calculated. The differences presented in Table 79, show that non-European PhD students are significantly less familiar than Dutch and European (non-Dutch) students with their options in their field regarding a career both inside and outside academia.

Table 79 To what extent are you familiar with the options in your field regarding a career? (presented by nationality group)

| Nationality | Inside academia | | | Outside academia | | |
	N	M	Sd	N	M	Sd
Dutch	425	3.2	1.0	420	3.0	1.1
European (non-Dutch)	186	3.2	1.1	189	2.9	1.0
Non-European	385	3.0	1.0	382	2.5	1.1

Ideas about job prospects with the UG/UMCG

First, PhD students were asked about their job prospects at the University of Groningen (see Table 80). Almost 40% did not think they would have opportunities there, while less than 20% believed there were sufficient options for them at the University. These numbers reflect a realistic view on options for future careers at UG/UMCG.

Table 80   There are sufficient job opportunities at this university after the completion of my PhD.

Answer	N	%
1. Completely disagree	144	13.7
2. Disagree	254	24.1
3. Neutral	366	34.8
4. Agree	156	14.8
5. Completely agree	28	2.7
6. Not applicable	105	10.0
Total	1053	100.0

Group differences

An average score was calculated (without the option 'Not applicable') where a low score indicates that a PhD student does not believe he/she has job opportunities at the UG and a high score indicates that he/she does. Differences between groups (phase, PhD student types, nationality group and Graduate Schools) were examined and results are summarized in Table 81). The idea that one can work at the UG after completing a PhD declines with the phase, reflecting a more realistic perspective. Regarding PhD type, external PhD students were most positive, while PhD scholarship students (type 2a) were the least positive. PhD students from GSL, GSMS and GSSE believed the most that they had opportunities at the UG, while those from GSH and GSP were the least positive.

Table 81   Average scores to proposition, 'There are sufficient job opportunities at this university after the completion of my PhD'.

		N	Mean	Sd
Phase	Starter	226	3.0	0.9
	Intermedior	419	2.6	1.0
	Senior	303	2.5	1.1
Max difference			0.5	
Nationality	Dutch	400	2.5	1.0
	EER	169	2.5	1.1
	non-EER	379	2.8	1.0
Max difference			0.3	

		N	Mean	Sd
PhD type	1a.Employed	438	2.6	1.0
	1b.Employee in PhD track	15	2.6	0.8
	2a.Scholarship UG/UMCG	216	2.4	1.1
	2b.Scholarship other	176	3.0	1.0
	3.Externally financed	56	2.8	1.1
	4.External	45	2.9	0.8
Max difference			0.6	
Graduate School	GSBSS	82	2.4	1.0
	GSCF	21	2.5	0.9
	GSEB	43	2.6	1.0
	GSH	85	2.2	1.0
	GSL	19	2.8	1.0
	GSMS	297	2.8	1.0
	GSP*	7	1.4	0.8
	GSSE	356	2.8	1.0
	GSSS	30	2.6	0.9
	GSTRS*	8	2.6	0.9
Max difference			1.4	

Acronyms: *GSBSS = Graduate School of Behavioural and Social Sciences, GSCF = Graduate School of Campus Fryslân, GSEB = Graduate School of Economics and Business, GSH = Graduate School of Humanities, GSL = Graduate School of Law, GSMS = Graduate School of Medical Sciences, GSP = Graduate School of Philosophy, GSSE = Graduate School of Science and Engineering, GSSS = Graduate School of Spatial Sciences, GSTRS = Graduate School of Theology and Religious Sciences. *GSP and GSTRS were not included in statistical tests*

Note: *Green indicates the highest scale score in a group, red indicates the lowest score in the case of the maximum difference being statistically significant.*
* GSP and GSTRS were not included in statistical tests.

Ideas about job prospects

PhD students were asked what they think about their job prospects after their PhD in general, and inside and outside academia. PhD students considered their job prospects 'in general', to be 'neutral' to 'good', with an average of 3.6 (on a five-point scale from very bad to very good). Over half (59%) believed their general job prospects were good to very good (see Table 82). However, job prospects inside academia were perceived as not as good as for outside academia. These results are comparable to 2019.

Table 82 What do you think about your job prospects after your PhD in general, and inside academia and outside academia?

	General		Inside		Outside	
Answer	N	%	N	%	N	%
1. Very bad	15	1.4	82	7.8	23	2.2
2. Bad	110	10.4	205	19.4	92	8.7
3. Neutral	263	25.0	369	35.0	318	30.2
4. Good	467	44.3	253	24.0	400	38.0
5. Very good	157	14.9	49	4.6	117	11.1
6. I don't know	42	4.0	96	9.1	103	9.8
Total	1054	100.0	1054	100.0	1053	100.0

Group differences

As shown in Table 83, PhD students were more positive about their prospects outside academia (3.5) than inside academia (3.0). For job prospects in general and inside academia, the most pronounced difference is between scholarship students and employed PhD students. With regard to job prospects outside academia, scholarship students were the least optimistic, while employed, externally financed and external PhD students were more optimistic. Starting PhD students were the most positive about their job prospects, and they considered their job prospects outside academia to be better than inside academia.

Dutch PhD students were the most positive about their job prospects outside academia, as they scored almost the equivalent of 'good', with 3.8, while non-EER PhD students had an average score of 3.3. This was reversed for job prospects within academia (2.8 in Dutch and 3.2 in non-EER). The differences between Dutch and non-EER students and between EER and non-EER students were significant.

Differences between Graduate Schools regarding job prospects are presented in Figure 33. PhD students from all Graduate Schools were more positive about their job prospects outside academia than inside academia. The largest difference was found between GSBSS and GSEB (0.7). PhD students from GSSS, GSMS and GSSE were the most positive about their job prospects inside academia. Interestingly, PhD students from GSSS believed their job prospects were better inside academia than outside.

Table 83 Average scores to job prospects in general, and inside and outside academia.

		In general		Inside academia		Outside academia	
	N	M	Sd	M	Sd	Mn	Sd
Total	973	3.6	0.9	3.0	1.0	3.5	
PhD student type							
1a. Employed	447	3.7	0.9	2.9	1.0	3.7	0.9
1b. Employee in PhD track	14	3.9	0.8	2.5	0.9	3.5	0.9
2a Scholarship UG/UMCG	221	3.5	0.9	2.9	1.0	3.4	0.9
2b. Scholarship other	176	3.4	0.9	3.3	0.9	3.2	0.9
3. Externally financed	67	3.8	0.9	3.0	1.1	3.7	0.9
4. External PhD	47	3.8	0.9	3.1	0.9	3.7	1.0
Max. difference		0.5		0.8		0.5	
Phase							
Starter	237	3.8	0.9	3.2	1.0	3.6	0.9
Intermedior	433	3.6	0.9	2.9	1.0	3.5	0.9
Senior	302	3.5	1.0	2.9	1.1	3.4	0.9
Max. difference		0.3		0.3		0.2	
Nationality							
Dutch	411	3.8	0.9	2.8	1.0	3.7	0.9
EER	186	3.7	1.0	2.9	1.1	3.6	0.9
Non-EER	376	3.5	0.9	3.2	1.0	3.3	0.9
Max. difference		0.3		0.4		0.4	

Note: *Green indicates the highest scale score in a group, red indicates the lowest score in the case of the maximum difference being statistically significant.*
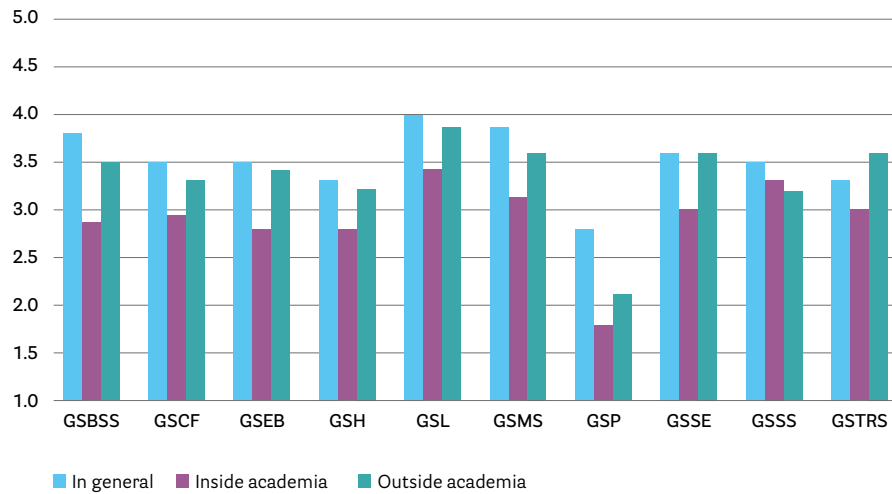
Figure 33 Job prospects in general, by presented by Graduate School.

Acronyms: *GSBSS = Graduate School of Behavioural and Social Sciences, GSCF = Graduate School of Campus Fryslân, GSEB = Graduate School of Economics and Business, GSH = Graduate School of Humanities, GSL = Graduate School of Law, GSMS = Graduate School of Medical Sciences, GSP = Graduate School of Philosophy, GSSE = Graduate School of Science and Engineering, GSSS = Graduate School of Spatial Sciences, GSTRS = Graduate School of Theology and Religious Sciences.*

Preferred jobs after PhD completion

As shown in Table 84, 53% of the PhD students wish to pursue a research career inside academia, 48% a research career outside academia and 33% a career outside research. As this question was phrased differently to the previous surveys, no comparison with previous years could be made.

Table 84 What career perspectives do you aspire to after graduation? (multiple answers possible)

Answer	N	%
1. In research within academia	594	52.9
2. In research outside academia	540	48.1
3. Outside research	369	32.9
4. I don't know	173	15.4

PhD students were asked to elaborate on their reasons why they preferred a career inside or outside academia. The most mentioned (at least n = 20) reasons for pursuing a career within academia were: love doing research, teaching, developing skills, research experience, have an impact, independence, interest over profit, knowledge building, the people and working environment. The main reasons mentioned by PhD students for preferring a career outside academia were: salary, job security/stability, less workload and pressure, different work environment, dislike of competition, hierarchies in academia, better work-life balance, more (direct) societal impact, opportunities.

Group differences
No differences were present for phase of the PhD project. Figure 34 shows which future career paths were preferred by PhD students of different Graduate Schools. The highest proportions (> 60%) of PhD students who indicated preferring a career in research inside academia were from GSCF, GSH, GSP and GSBSS. PhD students who preferred a career in research outside academia are mainly from GSEB, and a high proportion (> 50%) of PhD students from GSP indicated they would prefer a career outside research.
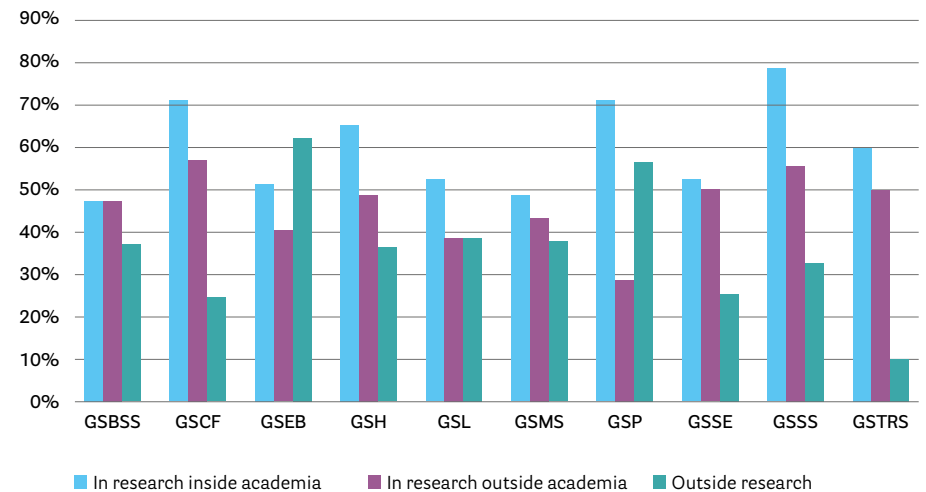
Figure 34 Career wishes presented by Graduate School

Acronyms: *GSBSS = Graduate School of Behavioural and Social Sciences, GSCF = Graduate School of Campus Fryslân, GSEB = Graduate School of Economics and Business, GSH = Graduate School of Humanities, GSL = Graduate School of Law, GSMS = Graduate School of Medical Sciences, GSP = Graduate School of Philosophy, GSSE = Graduate School of Science and Engineering, GSSS = Graduate School of Spatial Sciences, GSTRS = Graduate School of Theology and Religious Sciences.*
* GSP and GSTRS were not included in statistical tests.

Preferred careers outside academia

PhD students who indicated that they wished to pursue a career outside academia (n = 909) were asked where they aspire a career. As shown in Table 85, most PhD students would pursue a career in higher education (43%) or industry (38%). Of the 86 PhD students who indicated 'Other', 56 mentioned health care.

Table 85   **What career do you aspire to after completing your PhD trajectory?**

Answer	N	%
1. My own company	109	12.0
2. Industry	343	37.7
3. Government (national, regional or local)	316	34.8
4. University or other higher education institution	387	42.6
5. NGOs and other non-profit organizations	244	26.8
6. Other	86	9.5

Chapter conclusion

Almost half of the PhD students had already started to explore their future career options during their PhD project, as over half had attended at least one career preparation activity. The UG stimulates PhD students to start exploring their options for their future career from their first year onwards (Career Perspectives Series). Almost 80% were aware of the Career Perspectives Series courses, although differences were present, related to phase, Graduate School and PhD student type.

The PhD students were most satisfied with UG activities that focus on careers inside academia. Moreover, they felt they had more support from their supervisors and Graduate School in relation to a career inside compared to outside academia. In addition, they felt that the topic of their PhD and the skills they were learning were most useful for a career inside academia.

Almost 60% believed their general job prospects were good to very good. As in previous years, PhD students were more familiar with career options inside than outside academia. About 20% believed there were sufficient job opportunities at the UG or UMCG. This percentage declined with phase. PhD students from GSL, GSS, GSMS and GSSE were the most positive about their job prospects inside academia. PhD students who wished to pursue a career outside academia would like to work in higher education, industry or health care.

11 Conclusions

The aim of the biennial PhD surveys, as reflected in the results presented, is to monitor the effect of UG policies regarding PhD students and the actual outcomes in daily practice. The previous chapters have shown that, overall, PhD students are quite satisfied with their PhD trajectories. This can be concluded from the overall score of 7.3 on a ten-point scale, and from the scores on most of the more specific aspects of the PhD trajectory. However, there is also room for improvement on several of these aspects.

In this concluding chapter, we reflect on the following themes that are related to some important aspects of UG policy:
1. Attention to general and Covid-19 related mental health and workload
2. Decreasing the PhD finishing time
3. Helping all PhD students to use a Training and Supervision Plan
4. Improving familiarity with the role of the Graduate Schools
5. Broadening career-orientation opportunities towards careers outside academia

Attention to general and Covid-19 related mental health and workload

Around 15% of UG PhD students rated their mental health as poor to very poor and one-third mentioned that their PhD project has had a negative to rather negative impact on their mental health. These results are not exclusive to the UG; several national and international studies have shown that around 40% of PhD students experience mental health problems.

PhD students from outside the Netherlands and those in the last phase of their PhD project rated their mental health lower than did the PhD students in the other nationality groups. We found that PhD students on a scholarship other than one from UG/UMCG (who are often internationals) were less satisfied with their access to health facilities and that international students were less aware that a PhD psychologist was available. More attention needs to be paid to mental health, especially for internationals and PhD students in the last phase of their project.

As mentioned, workload is an important cause of mental health problems. About half of the PhD students perceived their workload as high or too high. The most often mentioned reasons for a high workload were complexity of the PhD work, problems related to Covid-19, deadlines and publication pressure. Covid-19 mainly affected two aspects of the PhD project, namely collection of data and the discussion of ideas and findings with supervisors and colleagues.

Moreover, PhD students indicated that their mental health, progress and motivation to work had been negatively affected by the pandemic.

The percentage of PhD students who worked more than their contract/agreement hours has increased from 58% in 2017 to 76% in 2021. PhD students in the middle of their trajectory and those with a non-Dutch nationality worked significantly more overtime compared to the other PhD students. The proportion of PhD students who worked less than the hours stated in their agreement/contract also increased compared to 2019, possibly reflecting the decrease in motivation as a consequence of the Covid-19 situation. The pattern of an increase in the numbers of PhD students who work more and who work less than their official hours is comparable to a recent UK study on the impact of Covid-19 on researchers and academic staff.

De Rooij et al. (2019) have shown that high workload is negatively related to satisfaction and progress and positively related to the intention to quit. In 2021, almost one third (29%) of PhD students in our survey had thoughts about quitting their project (2019: 41%; 2017: 26%). The percentage of PhD students who actually quit is much lower (3% in both 2018/19 and 2019/20). Periods of doubt are common in PhD trajectories and often occur in two distinct periods: after the first year, when PhD students are often uncertain about their capabilities; and nine to twelve months before finishing, when they often experience a high workload and are uncertain about their (academic) future. In the 2021 survey, PhD students mentioned general and (Covid-19 related) related mental health problems and lack of motivation as important reasons for considering quitting. Helping PhD students to effectively manage the heavy workload should be a major point of attention, in order to increase the PhD completion rate and the PhD candidates' satisfaction.

In addition, de Rooij et al. (2019) have shown that a sense of belonging is positively related to satisfaction with the PhD trajectory and negatively related to the intention to quit. In 2021, we found that academic and informal relationships with colleagues and a sense of belonging in the department scored moderately. We also found that, on average, non-Dutch PhD students were less satisfied with their PhD trajectory than were Dutch PhD students. Stimulating a sense of belonging in the department, especially for non-Dutch PhD students, could decrease the risk of mental health problems and might increase satisfaction with the PhD trajectory in this group.

Decreasing the PhD finishing time

In 2018, the nationwide average time to complete a PhD was 61 months; thus, five years on average. The average for the UG was a little over five years (62 months in 2017). As the majority of PhD students have a contract for four years, this means that many PhD students do not

finish their PhD before their contract finishes. In the survey, the proportion of PhD students who said that they were delayed increased from around 25% in 2019 to 50% in 2021, and the duration of the delay foreseen by the respondents has also increased. This is most likely due to Covid-19-related problems, such as practical setbacks and motivational problems, which were often mentioned as explanations for the expected delay.

Van de Schoot, Yerkes, Mouw and Sonneveld (2013) indicated that minimizing PhD delay could be facilitated by ensuring that PhD planning is undertaken within a reasonable period and by systematically evaluating the progress of PhD students. Although most PhD students at the UG have a training and supervision plan finalized within three months after the start of their PhD, 62% of the respondents indicated that it was not updated at least once a year (60% in 2019). The importance of a regular update should not be underestimated. By ensuring that the planning remains feasible for the PhD student, it might be possible to overcome unexpected practical setbacks and to shorten possible delays. If a PhD student and supervisor succeed in maintaining a realistic plan, the workload perceived by the PhD student might also change.

In addition, the 'match' between PhD candidates and the supervisor is crucial for PhD success, both personally and academically (de Rooij et al., 2019). Overall, UG PhD students were generally very satisfied with the supervision they receive, although this decreased with phase. The relationship with the daily supervisor was considered good to very good and slightly better than with the primary supervisor. The daily supervisor also scored slightly better than the primary supervisor on availability, as well as on academic and personal support.

Training and Supervision Plan

This year, 94% of the PhD students reported that they had a TSP, which is a major increase in comparison to two years ago (77%). Almost three quarters had their TSP formalized within three months after the start of their project. A TSP was less often present for employees in a PhD track, externally financed PhD students and external PhD students. Some efforts are still required to achieve the goal of every PhD student having a TSP, especially in the Graduate School of Law.

Over the years, about 10% of the respondents have not been able to name any of the elements described in the TSP. According to the PhD students, in most TSPs, educational activities, a work plan and the research content are specified, but the PhD requirements, evaluation moments, teaching activities and the number of contact hours are less often mentioned. Compared to 2019, we saw an increase in the percentage of respondents who confirmed that their TSP described teaching activities and planning. The elements in the TSP differed between Graduate Schools because no standardized format is available at this point in time. For the TSP

to be a genuinely helpful instrument in the PhD trajectory, it is important to include all of the elements in all TSPs and update the TSP regularly. In agreement with the above findings, PhD students do not agree with the idea that their current TSP is a good guideline or assists with their planning. However, the latter could be an important goal of a TSP, which could be used as such in relation to delay, as described in the first part of this conclusion. While planning and progress are discussed during the R&D evaluation moments, alterations are not always incorporated into the TSP.

Providing information

In the present report, the provision of information focusing on employment or scholarship conditions and on thesis submission was assessed. On both aspects, the majority of the PhD students indicated that they had received sufficient information. However, with respect to employment or scholarship conditions, those employees and PhD scholarship students who indicated that they did not receive sufficient information, also indicated that they would welcome the conditions being mentioned earlier in the application process, as well as more openness beforehand regarding the differences between an employment and scholarship PhD position. This apparent feeling of not having sufficient information was supported by the finding that PhD scholarship students were significantly more negative about the rules and regulations for sickness and their research budget than were employee PhD students, while, in fact, there are no differences in these conditions. Although all of the information is provided on the website and is stipulated in the contracts, more focused information provision to both groups of PhD students might address this issue.

Another issue that relates to the provision of information is the finding that PhD students still feel insufficiently trained for teaching and guiding undergraduate students. Similar to 2019, nearly two thirds of the PhD students who teach and/or guide students reported that they had not received any training in how to do this. This was a surprising finding in view of the increased offer of teacher training within the newly developed Career Perspectives Series, which encompasses several teaching courses that focus on how to give lectures and teach practicals, as well as how to guide students. The information on this is clearly presented on the website but, apparently, both the supervisors and PhD students need to be made more aware of these courses. This could help PhD students feel more confident in teaching and guiding undergraduate students. It is advisable to explore the aspects in which PhD students do not feel prepared, also in relation to the attendance of specific teacher training courses.

Improving familiarity with the role of the Graduate Schools

Nearly all of the PhD students were familiar with their Graduate School, with only a few not knowing what Graduate School they were in or mentioning another Graduate School than the one indicated in Hora Finita. This finding is similar to two years ago and shows that Graduate Schools have become a part of the PhD trajectory of PhD students.

The two most often mentioned types of support that PhD students receive from their Graduate School are the provision of information and courses/workshops. Both types of support were mentioned by approximately two thirds of the PhD students, which is an increase of about 5% compared to the results of two years ago. The other two roles – keeping track of progress and supporting PhD students in the case of problems – were mentioned by around one third of the respondents, similar to 2019.

The support that PhD students reported receiving broadly defines two groups of Graduate Schools. Most of the PhD students from the Graduate Schools of Economics and Business, Law, and Spatial Sciences indicated that they received all four types of support. The PhD students belonging to the Graduate Schools of Behavioural Sciences, Campus Fryslân, Humanities, Medical Sciences, Philosophy, Science and Engineering, Theology and Religious Studies acknowledged they received support by means of courses and the provision of information, but fewer respondents indicated that they received the other two types of support.

It is not only in terms of the kind of support that PhD students receive from their Graduate School that there are differences, satisfaction levels also differ considerably between Graduate Schools. Clearly, there are points for improvement for at least some Graduate Schools. Generally, however, the satisfaction with the Graduate Schools is similar to that of two years ago.

Broadening career-orientation opportunities

The UG aims to stimulate PhD students to start exploring their options for a future career as early as the first year of their PhD. The reason for this is that only 25% will ultimately pursue an academic career and that an early orientation towards career options outside academia is important. In this report, it was found that 23% of the first-year PhD students actually do this. This is similar to the findings of two years ago, as is the total percentage of PhD students who were exploring their options for a future career (45%). At the same time, the percentage of PhD students who know that the UG offers ample opportunities for career training (e.g. the Career Perspectives Series) has increased from 66% two years ago to 79% this year. The finding that the Career Perspectives Series has gained in awareness is also supported by the finding that

89% of PhD scholarship students know about it. Apparently, career training by the UG is clearly in the picture for PhD students who are exploring options for a future career, but there is still work to be done to convince more PhD students to start exploring their options early in their PhD trajectory.

In general, PhD students felt more familiar with and better prepared for a career inside academia than outside academia, although they considered their job prospects outside academia to be better. Moreover, PhD students felt that the topic of their PhD and the skills they were learning were most useful for a career inside academia. PhD students were neutral about the guidance that the University offers regarding career preparation, especially in relation to options outside academia. As this is an important aim of the Career Perspectives Series, more in-depth research into this aspect might be useful to identify how PhD students might be better supported, such that they feel better prepared for a career outside academia.

Appendices

Statistical testing for group differences

Comparisons between Graduate Schools were tested with non-parametric Kruskal-Wallis tests, as the groups differ to a large extent in number of respondents and the normality of the Likert scale data could not be assumed for the small groups. The Graduate Schools of Philosophy (N = 7) and Theology and Religious Studies (N = 10) were not included in statistical analyses because the numbers are considered too small to be representable. By means of the Bonferroni correction, a correction was made for cases where multiple comparisons were made. The total significance level for each test was p = .05.

Table A1   **Overview of groups and their categories**

Groups	Category	Analysis
Nationality	Dutch	One-way Anova
	EER, but non Dutch	
	Non-EER	
Phase	Starter	One-way Anova
	Intermedior	
	Senior	
Affiliation	1a. Employed PhD student	One-way Anova
	1b. Employee in PhD track	
	2a. PhD student on UG/UMCG scholarship (2a)	
	2b. PhD student on other scholarship (2b)	
	3. Externally financed PhD student	
	4. External PhD students	
Graduate School	Behavioural and Social Sciences	Kruskal-Wallis
	Campus Fryslân	
	Economics and Business (SOM)	
	Humanities	
	Medical Sciences	
	Law	
	Science and Engineering	
	Spatial Sciences	

Appendix B
Informed consent

Table B1 Informed consent by data collection goal

Informed consent by data collection goal	N	% of 1128
1. To improve PhD programmes at the University of Groningen	1123	99.6
2. To gain more insight in doctoral success	1107	98.1
3. To evaluate the national PhD Scholarship experiment	1094	97.1
4. To gain insight into the experiences of PhD students at the national level	1116	98.9

Appendix C
General

Table C1 Where did you obtain your most recent Master's degree (or equivalent)?

University location	N	%
University of Groningen	415	37.1
Another Dutch university	173	15.4
Another European university	217	19.4
A university outside Europe	315	28.1
Total	1120	100.0

Table C2 Are you familiar with the University's PhD registration system 'Hora Finita'?

Answer	N	%
Yes	1059	95.0
No	60	5.0
Total	1119	100.0

Table C3 What is the name of your research institute?

Research institute	N	%
BCN-BRAIN	60	5.3
Bernoulli	47	4.2
CLCG	31	2.8
CRCG	43	3.8
CRS	1	0.1
ENTEG	59	5.3
ESRIG	20	1.8
GBB	38	3.4
GCL	1	0.1
GELIFES	60	5.3
GIA	15	1.3
GRIP	35	3.1
GRIPh	3	0.3
GUIDE-UMCG	106	9.4
Het Heymans Instituut (Psychologie)	50	4.5

Research institute	N	%
Het Nieuwenhuis Instituut (Pedagogische Wetenschappen en Lerarenopleiding)	19	1.7
Het Gronings Centrum voor Sociaal-Wetenschappelijk Onderzoek (Sociologie).	9	0.8
ICOG	46	4.1
ISEC	3	0.3
Kapteyn Institute	20	1.8
Kolff Institute	36	3.2
KVI	3	0.3
Research Institute Campus Fryslan	15	1.3
SHARE	105	9.3
SOM	46	4.1
Stratingh Institute	30	2.7
URSI	25	2.2
Van Swinderen Institute	7	0.6
Zernike Institute for Advanced Materials (ZIAM)	88	7.8
Other	53	4.7
I do not know	49	4.4
Total	1123	100.0

Research environment

Table D1 When thinking about your research facilities before the Covid-19 pandemic – How satisfied are you with the following facilities?

Answer	Workplace		Computer and software		Research facilities (e.g. lab, instruments, fieldwork, databases)	
	N	%	N	%	N	%
Very Dissatisfied	27	2.4	30	2.7	19	1.7
Dissatisfied	84	7.6	104	9.4	51	4.6
Neither satisfied nor dissatisfied	155	13.9	167	15	182	16.4
Satisfied	520	46.8	519	46.7	492	44.2
Very Satisfied	251	22.6	225	20.2	207	18.6
I have no access to this facility	75	6.7	67	6	161	14.5
Total	1112	100.0	1112	100.0	1112	100.0

Answer	Access to library (e.g. journals, books, and other resources)		Technical support in your own research group/institute		Research support services (e.g. Research Data Office, GeoServices, High Performance Computing)	
	N	%	N	%	N	%
Very Dissatisfied	8	0.7	22	2	15	1.3
Dissatisfied	27	2.4	78	7	37	3.3
Neither Satisfied nor Dissatisfied	149	13.4	262	23.6	338	30.4
Satisfied	532	47.8	462	41.5	398	35.8
Very Satisfied	353	31.7	217	19.5	151	13.6
I have no access to this facility	43	3.9	71	6.4	173	15.6
Total	1112	100.0	1112	100.0	1112	100.0

Table D2   **To what extent do you have contact with other researchers when working on your PhD project?**

Answer	N	%
(Almost) every day	269	24.5
Regularly	451	41.0
Rarely	258	23.5
Only when I meet my supervisors	112	10.2
Other	9	0.8
Total	1099	100.0

Application process and project

Table E1   **How did you find out about your PhD project?**
This question is only answered by employed PhD students who are in their first year.

Answer	N	%
I saw a vacancy for a PhD project	50	27.3
Someone from the University told me and asked me to apply for an existing vacancy or project	31	16.9
I was offered a PhD position	38	20.8
I applied with my own proposal	52	28.4
Other	12	6.6
Total	183	100.0

Table E2   **How did you find out about your PhD Scholarship Programme?**
This question is only answered by PhD Scholarship Programme students who are in their first year.

Answer	N	%
I did a Research Master's degree at the UG and they told me about it at the department	9	12.3
I saw the information on the UG website	12	16.4
Via my funding agency that awarded my scholarship	7	9.6
Via (one of my) supervisors	20	27.4
During/after my application interview	8	11.0
Other	17	23.3
Total	73	100.0

Table E3 Which of the following descriptions best fits your application process?

Answer	N	%
I was offered a PhD position without a formal application interview	154	13.7
The application process consisted of one (or more) formal interviews	812	72.3
The application process consisted of a presentation	464	41.3
The application process consisted of an assignment	136	12.1
I wrote my own proposal	600	53.4
Total	1123	100.0

Table E4 Who was on the selection committee? (multiple answers possible).
This question is only answered by first year PhD students.

Answer	N	%
My supervisor(s)	175	68.4
Other people from the department in which I currently work	100	39.1
Someone from HRM or the Graduate School	66	25.8
Someone from a funding agency	27	10.5
I do not know	9	3.5
Other	17	6.6
Total	256	

Table E5 Which of the following descriptions best fits your PhD project?

Answer	N	%
My project is a stand-alone project; I am the only one in my department who is working on this topic	415	25.6
My project is closely linked to other PhD students' projects	346	21.3
My project is closely linked to research by a postdoc or other colleagues	189	11.6
My project is closely linked to my daily supervisor's and/or my promotor's research	469	28.9
My project is part of a national or international consortium	173	10.7
Combination of aforementioned options	26	1.6
Other	5	0.3
Total	1623	100.0

Language difficulties

Table F1 Please indicate whether you have ever experienced any of the following language difficulties (multiple answers possible).

Answer	N	%
Problems with writing and presenting in academic English	296	26.4
Problems with writing and presenting in academic Dutch	124	11.0
Problems with general communication in the workplace due to being a non-native English speaker	162	14.4
Problems with general communication in the workplace due to being a non-native Dutch speaker	173	15.4
Problems due to colleagues being non-native English speakers	165	14.7
None of the above	560	49.9
Something else	15	1.3
Total	1123	

Appendix G
Supervision

Table G1 Where is your supervision team based?

Answer	N	%
All supervisors work at the UG/UMCG in my department	530	47.2
All supervisors work at the UG/UMCG, but in different departments	196	17.5
All supervisors work at the UG/UMCG, but in different faculties	44	3.9
One or more supervisors work at the UG/UMCG and one or more at another university in the Netherlands	93	8.3
One or more supervisors work at the UG/UMCG and one or more at another university in another country	155	13.8
One or more supervisors work at the UG/UMCG and one or more at an applied university, company or organization	77	6.9
Other	28	2.5
Total	1123	100.0

Table G2 Have you ever experienced substantial disagreement within the supervision team?

Answer	N	%
Never	705	62.8
Once	97	8.6
A few times	212	18.9
Several times	51	4.5
Regularly	18	1.6
Not applicable	40	3.6
Total	1123	100.0

Appendix H
Group differences for supervisors' availability and support

Table H1 to H4 show the average scale scores for availability and support from the first and daily supervisor. The scale scores are displayed for phase, nationality, PhD student type Graduate School.

Availability
Table H1 shows the average scale scores for the supervisors' availability. PhD students from the GSCF are significantly less satisfied with both the first and daily supervisor. Those from GSL agree most with statements regarding the availability of their daily supervisor, which is a positive development since in 2019 PhD students from GSL agreed the least.

Table H1 Mean scale scores per phase, nationality, affiliation and Graduate School for first supervisor and daily supervisor on the availability scale

Availability		First supervisor			Daily supervisor		
		N	Scale	Sd	N	Scale	Sd
Phase	Starter	263	4.4	0.7	208	4.6	0.6
	Intermedior	475	4.2	0.9	367	4.4	0.8
	Senior	334	4.1	0.9	244	4.3	0.7
	Max difference		0.3			0.3	
Nationality	Dutch	470	4.1	0.8	349	4.4	0.6
	EER	198	4.1	0.9	144	4.4	0.8
	Non-EER	404	4.3	0.8	326	4.4	0.8
	Max difference		0.2			0.0	
PhD type	Employed	472	4.1	0.9	347	4.4	0.7
	Employee in track	24	4.2	0.6	16	4.5	0.5
	PhD scholarship student	231	4.2	0.8	173	4.4	0.7
	Scholarship other	195	4.3	0.8	158	4.3	0.8
	Externally financed	78	4.2	0.8	66	4.5	0.5
	External	69	4.2	0.9	56	4.4	0.8
	Max difference		0.2			0.2	
Graduate School	GBSS	87	4.2	0.9	77	4.5	0.6
	GSCF	20	3.5	1.2	20	4.2	0.9
	GSEB	53	4.3	0.7	47	4.5	0.6
	GSH	90	4.3	0.6	71	4.5	0.7
	GSL	23	4.2	1.0	13	4.6	0.6
	GSMS	364	4.2	0.8	276	4.4	0.7
	GSP*	7	4.2	1.2	6	5.0	0.0
	GSSE	385	4.1	0.9	273	4.3	0.8
	GSSS	33	4.3	0.8	30	4.5	0.5
	GSTRS*	10	4.5	0.5	6	4.6	0.5
	Max difference		0.8			0.4	

Note: *Green indicates the highest scale score in a group, red indicates the lowest score in the case of the maximum difference being statistically significant.*
* GSP and GSTRS were not included in the statistical tests.

Academic support scale

Table H2 shows the average scales scores for the supervisors' academic support. First-year PhD students have more the impression that they are academically well supported than senior PhD students. PhD students from non-EER countries perceive more that they get adequate academic support than those from EER countries. PhD students from the GSCF are the least satisfied about the academic support provided by their supervisors.

Table H2 Mean scale scores per phase, nationality, affiliation and Graduate School for first supervisor and daily supervisor on the academic support scale

Academic support		First supervisor			Daily supervisor		
		N	Scale	Sd	N	Scale	Sd
Phase	Starter	263	3.8	0.7	27 4	4.0	0.7
	Intermedior	473	3.5	0.8	495	3.8	0.8
	Senior	335	3.4	0.9	353	3.7	0.8
	Max difference		0.4			0.3	
Nationality	Dutch	470	3.4	0.7	489	3.7	0.7
	EER	197	3.4	0.8	208	3.7	0.9
	Non-EER	404	3.8	0.8	425	4.0	0.8
	Max difference		0.4			0.3	
PhD type	Employed	470	3.5	0.8	496	3.7	0.8
	Employee in track	23	3.4	0.7	24	3.7	0.8
	PhD scholarship student	232	3.5	0.8	242	3.7	0.8
	Scholarship other	194	3.9	0.7	203	4.0	0.8
	Externally financed	80	3.5	0.6	81	3.8	0.6
	Ex ternal	69	3.6	0.9	73	4.0	0.8
	Max difference		0.5			0.3	
Graduate School	GBSS	89	3.5	0.8	92	3.7	0.8
	GSCF	20	3.1	0.8	21	3.6	0.7
	GSEB	53	3.5	0.7	53	3.7	0.7
	GSH	90	3.5	0.8	94	3.7	0.8
	GSL	23	3.6	1.0	23	3.7	0.9
	GSMS	364	3.6	0.8	37 5	3.8	0.8
	GSP*	6	3.5	0.7	6	4.0	0.3
	GSSE	383	3.6	0.8	414	3.8	0.8
	GSSS	33	3.5	0.8	34	3.9	0.8
	GSTRS*	10	3.8	0.4	10	4.0	0.6
	Max difference		0.5			0.3	

Note: *Green indicates the highest scale score in a group, red indicates the lowest score in the case of the maximum difference being statistically significant.*
* GSP and GSTRS were not included in the statistical tests.

Personal support scale

Table H3 shows the average scale scores for supervisor's personal support. PhD students from the GSL are significantly more positive about the personal support of both their supervisors. As with the other scales, again PhD students of GSCF are the least satisfied.

Table H3 Mean scale scores per phase, nationality, affiliation and Graduate School for first supervisor and daily supervisor on the personal support scale

		First supervisor			Daily supervisor		
Personal support		**N**	**Scale**	**Sd**	**N**	**Scale**	**Sd**
Phase	Starter	264	4.2	0.7	210	4.3	0.6
	Intermedior	474	4.0	0.7	361	4.1	0.7
	Senior	337	3.9	0.8	244	4.1	0.8
	Max difference		0.3			0.2	
Nationality	Dutch	471	4.0	0.7	346	4.2	0.6
	EER	197	4.0	0.8	146	4.2	0.8
	Non-EER	407	4.0	0.8	323	4.1	0.8
	Max difference		0.0			0.1	
PhD type	Employ ed	471	3.9	0.8	345	4.1	0.7
	Employee in track	24	4.1	0.6	15	4.1	0.9
	PhD scholarship stude	235	4.0	0.7	17 3	4.2	0.8
	Scholarship other	194	4.1	0.7	157	4.0	0.8
	Externally financed	79	4.2	0.5	66	4.3	0.5
	Ex ternal	69	4.1	0.8	56	4.2	0.9
	Max difference		0.3			0.3	
Graduate School	GBSS	89	4.1	0.8	76	4.3	0.7
	GSCF	20	3.7	0.7	20	4.1	0.7
	GSEB	53	4.0	0.7	46	4.1	0.6
	GSH	90	4.0	0.8	71	4.1	0.8
	GSL	23	4.4	0.8	13	4.6	0.6
	GSMS	361	4.0	0.7	27 6	4.2	0.6
	GSP*	7	4.1	0.8	6	4.4	0.5
	GSSE	388	4.0	0.8	27 2	4.0	0.8
	GSSS	34	4.1	0.6	30	4.2	0.7
	GSTRS*	10	4.3	0.4	5	4.1	0.5
	Max difference		0.7			0.6	

Note: *Green indicates the highest scale score in a group, red indicates the lowest score in the case of the maximum difference being statistically significant.*
* GSP and GSTRS were not included in the statistical tests.

Autonomy scale

Table H4 shows the average scale scores for the supervisors' autonomy support. Group differences for this scale are less pronounced than for the other scales except between Graduate Schools. The daily supervisors from the Graduate School of Law received, on average, a significantly higher score than the daily supervisors from the Graduate School of Science and Engineering.

Table H4 Mean scale scores per phase, nationality, affiliation and Graduate School for first supervisor and daily supervisor on the autonomy scale

		First supervisor			Daily supervisor		
Autonomy		**N**	**Scale**	**Sd**	**N**	**Scale**	**Sd**
Phase	Starter	263	4.2	0.5	205	4.2	0.5
	Intermedior	468	4.0	0.6	361	4.1	0.6
	Senior	334	4.0	0.6	244	4.0	0.6
	Max difference		0.2			0.2	
Nationality	Dutch	466	4.1	0.6	343	4.2	0.5
	EER	196	4.1	0.6	145	4.2	0.6
	Non-EER	403	4.0	0.6	322	4.0	0.6
	Max difference		0.1			0.2	
PhD type	Employ ed	466	4.0	0.6	345	4.1	0.5
	Employee in track	24	4.2	0.5	15	4.2	0.6
	PhD scholarship student	232	4.1	0.6	17 0	4.1	0.6
	Scholarship other	193	4.0	0.6	156	4.0	0.6
	Externally financed	78	4.2	0.5	66	4.3	0.5
	Ex ternal	69	4.2	0.7	55	4.2	0.7
	Max difference		0.2			0.3	
Graduate School	GBSS	89	4.1	0.7	76	4.1	0.7
	GSCF	20	4.0	0.5	20	4.3	0.4
	GSEB	52	4.2	0.5	46	4.1	0.6
	GSH	89	4.1	0.6	72	4.2	0.6
	GSL	23	4.3	0.6	13	4.6	0.4
	GSMS	361	4.0	0.6	27 0	4.1	0.5
	GSP*	6	4.3	0.8	6	4.5	0.5
	GSSE	382	4.0	0.6	27 2	4.0	0.6
	GSSS	33	4.2	0.5	30	4.3	0.5
	GSTRS*	10	4.3	0.7	5	3.9	0.7
	Max difference		0.3			0.6	

Note: *Green indicates the highest scale score in a group, red indicates the lowest score in the case of the maximum difference being statistically significant.*
* GSP and GSTRS were not included in the statistical tests.

Group differences for relationship and sense of belonging

Table I1 shows the average scale scores for academic and informal relationships within the department and sense of belonging. These scale scores are displayed for phase, nationality, Graduate School and PhD student type. Senior PhD students are more positive about the informal relationships with their colleagues compared to starters. External PhD students feel the least connection with their colleagues and department (as been found in previous years). External PhD students as well as externally funded PhD students score lower on the 'informal/social relationship' scale than the other PhD types. This is most likely due to the fact that these PhD students work elsewhere (or from home) and are not very integrated within the UG or UMCG. Table I1 also shows differences between Graduate Schools. For all three scales, the GSEB has the lowest average scale score.

Table I1   Descriptive statistics per group for the academic relationship scale, informal/social relationship scale and sense of belonging scale

		Academic relationship			Informal relationship			Sense of belonging		
Autonomy		**N**	**Scale**	**Sd**	**N**	**Scale**	**Sd**	**N**	**Scale**	**Sd**
Phase	Starter	262	3.5	0.7	258	3.0	1.0	250	3.8	0.7
	Intermedior	484	3.5	0.7	482	3.3	0.9	47 8	3.7	0.8
	Senior	343	3.6	0.8	337	3.5	0.9	337	3.7	0.8
	Max difference		0.1			0.5			0.1	
Nationality	Dutch	475	3.6	0.8	472	3.3	1.0	469	3.8	0.7
	EER	195	3.4	0.8	193	3.3	1.0	191	3.6	0.8
	Non-EER	419	3.5	0.7	412	3.2	0.9	405	3.7	0.8
	Max difference		0.2			0.1			0.2	
PhD type	Employ ed	490	3.6	0.7	490	3.4	1.0	485	3.8	0.8
	Employee track	24	3.8	0.8	24	3.3	1.0	24	3.8	0.8
	PhD scholarship	242	3.5	0.8	241	3.3	1.0	241	3.7	0.8
	Scholarship other	201	3.5	0.7	199	3.1	0.8	195	3.6	0.8
	Externally finan.	66	3.5	0.7	65	3.0	1.1	63	3.7	0.6
	Ex ternal	63	3.4	0.9	55	2.9	0.9	54	3.5	0.8
	Max difference		0.4			0.5			0.3	

		Academic relationship			Informal relationship			Sense of belonging		
Autonomy		**N**	**Scale**	**Sd**	**N**	**Scale**	**Sd**	**N**	**Scale**	**Sd**
Graduate School	GBSS	87	3.5	0.7	85	3.2	1.0	87	3.7	0.7
	GSCF	21	3.6	0.7	21	3.6	0.8	21	3.9	0.8
	GSEB	52	3.1	0.8	51	2.9	0.9	49	3.3	0.8
	GSH	90	3.2	0.8	88	3.0	1.2	86	3.6	0.8
	GSL	21	3.6	0.6	21	3.2	1.0	21	4.1	0.7
	GSMS	364	3.7	0.7	359	3.4	0.9	356	3.8	0.8
	GSP*	7	3.2	0.6	7	2.9	1.1	7	3.5	0.5
	GSSE	404	3.6	0.7	403	3.3	0.9	396	3.8	0.8
	GSSS	33	3.3	0.6	32	3.0	0.6	32	3.6	0.7
	GSTRS*	10	3.1	0.4	10	2.6	0.8	10	3.4	0.4
	Max difference		0.6			0.6			0.8	

Note: *Green indicates the highest scale score in a group, red indicates the lowest score in the case of the maximum difference being statistically significant.*
* GSP and GSTRS were not included in the statistical tests.

Appendix J
Planning and output

Table J1   **Has an official completion date been agreed?**
This question is only answered by external PhD students (group 3)

Answer	N	%
Yes	31	30.1
No	72	69.9
Total	103	100.0

Differences are present between PhD students in their first year (starters) and intermedior/
seniors: 41% of the starters indicate that an official date has been agreed versus 25% resp.
21% in intermediors and seniors.

Table J2   **With whom did you agree the completion date?**
*This question is only answered by external PhD students who indicated
Yes in the previous question.*

Answer	N	%
Primary supervisor	21	72.4
Employer	4	13.8
Someone else	4	13.8
Total	29	100.0

Table J3   **What output have you produced so far? (multiple answers are possible).**

Answer	N	%
Finalized my research plan	714	63.6
Collected data	842	75.0
Presented my work at a conference	651	58.0
Written one or more articles (or chapters for my thesis)	728	64.8
Published one or more articles	469	41.8
Other, namely:		
– finished thesis	18	1.6
– other preparations	15	1.3
– something else	11	1.0
Total	1123	

Appendix K
Familiarity with counsellors

Table K1   **Do you know if there are counsellors available to whom you can go to when
you encounter problems (e.g. related to your wellbeing, social safety issues,
or problems with your supervisor)?**

Answer	N	%
Yes, I am aware of the availability of these counsellors	882	78.5
No, I am not aware of the availability of these counsellors	241	19.5
Total	1123	100.0

Table K2   **With which of the following counsellors are you familiar? (multiple answers allowed)**

Answer	N	%
PhD counsellors (FSE, MED)	461	52.3
Scientific integrity advisor	268	30.4
PhD mentor	288	32.7
Confidential advisor	380	43.1
PhD psychologist	358	40.6
PhD coordinator	311	35.3
GS coordinator	149	16.9
Other	36	4.1
Total number of PhD's that select at least one option	882	

Note: *Of PhD students who answered 'other', several mention the AMD services and the
SSC (PhD) support group.*

Appendix L
Activities of Graduate Schools and PhD organizations

Table L1   Did you attend the PhD introductory event organized by the Groningen Graduate Schools? In most cases this was a two-day event with the first day held at Allersmaborg.

Answer	N	%
Yes	627	55.9
No	370	33.0
I do not remember	52	4.6
Not applicable to my situation	73	6.5
Total	1122	100.0

Table L2   Apart from the Groningen Graduate Schools, are you involved in another national/international Graduate School or research school?

Answer	N	%
No	867	77.3
Yes	255	22.7
Total	1122	100.0

The organizations that are mentioned by more than 5 PhD students are BCN (N = 100), KLI (N = 13), ICO (N = 10), Archon (N = 9), ICS/SCOOP (N = 8), SHARE (N = 7).

Table L3   Are you familiar with the Federation of Graduate Schools in Social Sciences and Humanities?
This question is only displayed to PhD students from the following Graduate Schools: Behavioural and Social Sciences, Economics and Business, Humanities, Law, Philosophy, Spatial Sciences, and Theology and Religious Studies.

Answer	N	%
Yes	75	24.0
No	238	76.0
Total	313	100.0

Table L4   Please indicate with which of the following PhD organizations you are familiar (multiple answers are possible).

Answer	N	%
GOPHER (Groningen Organization for PhD Education and Recreation)	711	63.3
GRIN (Groningen Graduate Interest Network)	241	21.5
PhD council of your Graduate School	770	68.6
PNN (Promovendi Netwerk Nederland)	239	21.3
Other	11	1.0
I do not know any of these organizations	185	16.5
Total	1123	

Table L5   Do you often participate in activities of Gopher, GRIN or the PhD council of your Graduate School?

Answer	N	%
Yes, I regularly participate in activities they organize	192	20.5
No, I do not (often) take part in activities	745	79.5
Total	937	100.0

Table L6   Do you think the PhD organizations in Groningen offer sufficient activities and services for PhD students?

Answer	N	%
Yes	508	54.2
No, I would like to see more of the following activities or services	34	3.6
I don't know	395	42.2
Total	937	100.0

Note: *Activities mentioned by more than one PhD student are mentioned here after: social activities (N = 7), for internationals (N = 2), for external PhD students (N = 2), for PhD students who do not live in Groningen (N = 4), practical skills (N = 2) and career opportunities (N = 3).*

Affiliation questions

Q1 to Q6 would lead to one of the six VSNU PhD student types. Table M1 to M6 display the division over the answer categories for these six questions. Which answer leads to which PhD student type student is shown in Table M7.

Because 31% of the PhD students misinterpreted one or more of the questions, information from Hora Finita (and not the survey answers) was used to compare the answers of different PhD student types. See for more information Chapter 2.

Q1 (ST.07)
Do you presently receive salary, funding and/or hours to conduct doctoral research?
1. Yes   –>   naar ST.08
2. No, contract/funding ended   –>   naar ST.08
3. No, never received salary, funding and/or hours (=type 4)

Q2 (ST.08)
Do /did you have an employment contract with the University of Groningen or
University Medical Center Groningen?
1. Yes   –>   naar ST.08a
2. No   –>   naar ST.08b

Q3 (ST.08a)
Is/was PhD candidate your primary UFO code (academic job classification) or the
UMC equivalent thereof?
1. Yes (=type 1a)
2. No (=type 1b)

Q4 (ST.08b)
Do did you receive a scholarship/grant from the UG or UMCG or from an external organization
(such as the EU, Nuffic, foreign university of another (non-profit) organisation)?
1. Yes   –>   naar ST.RUG.09a
2. No   –>   naar ST.08c

Q5 (ST.08c)
Do/did you have an employer (other than UG/UMCG) and are you allowed to work
on your PhD project during your working hours?
1. Yes (=type 3)
2. No (=type 4)

Q6 (ST.RUG.09a)
Which situation is applicable to you?
1. I have a full (or part-time) scholarship from UG/UMCG (=type 2a)
2. I have a scholarship from my own country and a top-up scholarship from UG/UMCG (=type 2b)
3. I had a scholarship from my own country and a top-up scholarship from UG/UMCG, but now I have an extension with a full scholarship from UG/UMCG (=type 2b)
4. Other situation

Table M1 **Do you presently receive salary, funding and/or hours to conduct doctoral research?**

Answer	N	%
Yes	965	85.9
No, not presently as my contract/funding has ended	98	8.7
No, I never received salary, funding and/or hours	60	5.3
Total	1123	100.0

Table M2 **Do /did you have an employment contract with the University of Groningen or University Medical Center Groningen? Note: excluded are employment contracts for small side-jobs to earn some extra money**

Answer	N	%
Yes	693	65.2
No	370	34.8
Total	1063	100.0

Table M3 **Is/was PhD candidate your primary UFO code (academic job classification) or the UMC equivalent thereof?**

Answer	N	%
Yes	623	89.9
No	70	10.1
Total	693	100.0

Table M4   Do did you receive a scholarship/grant from the UG or UMCG or from an external organization (such as the EU, Nuffic, foreign university of another (non-profit) organisation)?

Answer	N	%
Yes	297	80.3
No	73	19.7
Total	370	100.0

Table M5   Do/did you have an employer (other than UG/UMCG) and are you allowed to work on your PhD project during your working hours?

Answer	N	%
Yes	43	58.9
No	30	41.1
Total	73	100.0

Table M6   Which situation is applicable to you?

Answer	N	%
I have a full (or part-time) scholarship from UG/UMCG	170	57.2
I have a scholarship from my own country and a top-up scholarship from UG/UMCG	103	34.7
I had a scholarship from my own country and a top-up scholarship from UG/UMCG, but now I have an extension with a full scholarship from UG/UMCG	3	1
Other situation	21	7.1
Total	297	100.0

Table M7   Overview VSNU-type by answer-question combination

VSNU-type	Survey question	Answer
1a	ST.08a	1 (yes)
1b	ST.08a	2 (no)
2a	ST.RUG.09a	1 (full scholarship UG/UMCG)
2b	ST.RUG.09a	2 or 3 (top-up from UG/UMCG)
3	ST.08c	1 (yes)
4	ST.07	3 (never received funding)
4	ST.08c	2 (no)