

# Analyzing the Motivation and Expectations of the Next Generation of Geodesy Students in German-speaking Countries

## Analyse der Motivation und Erwartungen der nächsten Generation von Geodäsie-Studierenden im deutschsprachigen Raum

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### Summary

With a view at the long-term development of student numbers, this study attempts to gain an insight into the motivation of German-speaking first-year students in geodesy and surveying. With the help of a first-semester survey, which is carried out annually since 2013 by the Conference of Geodesy Students of German-speaking Universities (KonGeoS) an insight was gained about the motivations for taking up the study program. The survey also provides information about previous experiences and the students plans for the future, mainly regarding professional career prospects. The survey has been evaluated with the data of the winter semester 2022. This paper attempts to frame certain key points that seek to narrow down the requirements and expectations of those starting their professional career in the coming years, as they will play an essential role in the future development of institutions and commercial enterprises. Another focus is placed on ways to encourage high-school graduates to enroll in a geodesy program. This paper first tries to shed light on the development and the current situation on the German-speaking labor market with a focus on the field of geodesy. In addition, the situation at the German-speaking universities is discussed. This is followed by the presentation of the research methodology for the produced analysis, which used data of the first semester student numbers and the annual KonGeoS survey, evaluated at numerous universities in Germany, Austria and Switzerland. These data were then used in the following section, in combination with previous work from the literature, to analyze development of the past decades, concerning both the labor market as well as the situation at the universities. Finally, a conclusion with valuable insights is drawn, which is also placed in an international context.

**Keywords:** geodetic education, Conference of Geodesy Students of German-speaking Universities (KonGeoS), first semester students, survey, university, young surveyors, DACH (Germany, Austria, Switzerland)

### Zusammenfassung

Mit Blick auf die langfristige Entwicklung der Studierendenzahlen im deutschsprachigen Raum wird in dieser Studie versucht, einen Einblick in die Motivation der Studienanfänger in der Geodäsie zu

gewinnen. Die Konferenz der Geodäsie-Studierenden (KonGeoS) führt seit 2013 jährlich eine Erstsemesterumfrage an den deutschsprachigen Hochschulen und Universitäten durch. Mit Hilfe dieser Umfrage kann evaluiert werden, wie Studienanfänger auf das Geodäsie-Studium gekommen sind. Es können sowohl Aussagen über den vorherigen Bildungsweg als auch über weiterführende Pläne nach dem Abschluss getroffen werden. Grundlage für diese Studie sind die Umfrageergebnisse aus dem Wintersemester 2022. Darüber hinaus werden einige Kernpunkte formuliert, die die Anforderungen und Erwartungen des Berufsnachwuchses eingrenzen sollen. Ein weiterer Schwerpunkt liegt dabei auf der Frage, wie Abiturienten künftig für ein Geodäsie-Studium gewonnen werden können.

In diesem Beitrag wird zunächst die Entwicklung und die aktuelle Situation auf dem deutschsprachigen Arbeitsmarkt im Bereich der Geodäsie beleuchtet. Darüber hinaus wird die Situation an den deutschsprachigen Hochschulen und Universitäten erörtert. Es folgt die Darstellung der Forschungsmethodik. Für diese Analyse werden Daten zu Erstsemestern und die KonGeoS-Erstsemesterumfrage herangezogen. Diese Daten werden im folgenden Abschnitt in Kombination mit früheren Arbeiten aus der Literatur verwendet, um die Entwicklung der letzten Jahrzehnte zu analysieren. Abschließend wird ein Fazit mit wertvollen Erkenntnissen gezogen, welches auch im internationalen Kontext eingeordnet wird.

**Schlüsselwörter:** Geodätische Ausbildung, Konferenz der Geodäsie-Studierenden (KonGeoS), Studienanfänger, Umfrage, Universität, Berufsnachwuchs, DACH (Deutschland, Österreich, Schweiz)

## 1 Introduction

In Germany, Austria and Switzerland, there are a total of 24 universities and universities of applied sciences offering surveying-related courses of study. KonGeoS, the association of 22 surveying student councils from these three countries, has taken on the task of bringing the students from these universities together for a meeting every semester, i. e., every six months. The focus of these meetings is the professional as well as the interpersonal exchange.

In addition, there is a lot of discussion about the similarities and differences between the study programs and the various universities. Another task of the organization of KonGeoS is to bring the students together with the relevant associations and organizations of geodesy, as well as with potential employers. This is especially carried out through the work of the board, which is elected at the meetings by the member departments. Other important aspects are the public relations and the recruitment of young surveyors. Therefore, KonGeoS does a survey among new students once a semester to see how many new students there are and what motivated them to take up the program. This not only generates important numbers, but also allows for the effectiveness of PR campaigns. These statistics are then shared with the universities, as well as various societies and organizations that are involved in surveying. In this way, they can react to them and target their advertising more specifically to young people. In the following, both the job market and the course of study are considered. This way, the numbers of students, surveying technicians and surveying engineers from the three countries are compared and evaluated for the past years.

## 2 Background

With the demographic change in the German speaking countries becoming more and more visible and the lack of skilled workers becoming more and more urgent, this paper starts with a general overview of the German labor

market and further gives an introduction into the German system of higher education for the field of geodesy.

### 2.1 Development of the labor market

With the average birth rate per woman in Germany shrinking from 1.92 children per woman in 1990 to 1.53 children per woman in 2021 (Statistisches Bundesamt 2022a) and the immigration of young professionals stagnating, the supply of young workers is decreasing (Mergener 2021). At the same time the generation of the baby boomers is retiring. It is estimated that, by the year of 2036, 12.9 million workers will have reached the retirement age. This accounts for around 30 percent of the total German workforce. As shown in Tab. 1, the total workforce is estimated to decline: 8.2 % between 2019 and 2030 and a further 5.3 % until 2030. The total number of workers shall decline from 43.6 million in 2019 to 40 million by 2030 and further to 37.7 million by 2040. The median age is projected to stay stable around 44 years indicating a loss of mainly older workers retiring. The activity rate is estimated to fall from 70 % to 66 % following a general trend to work less (Statistisches Bundesamt 2022b).

There is no official data for the field of geodesy. Only one survey was conducted among geodesist employing companies in North Rhine-Westphalia in 2011. Fig. 1 shows the annual loss of workers, the need for new workers and the estimated number of new degree holders per year for the time 2012 to 2017. For Bachelor and Master graduates, there is a significant gap between the number of workers needed and the number of graduates indicating a further aggravation of the lack of skilled workers (Oestereich 2012).

There only seem to be enough geodesists graduating with an apprenticeship. This number is misleading though as a lot of them will continue to get a Bachelor's or even Master's degree (Oestereich 2012).

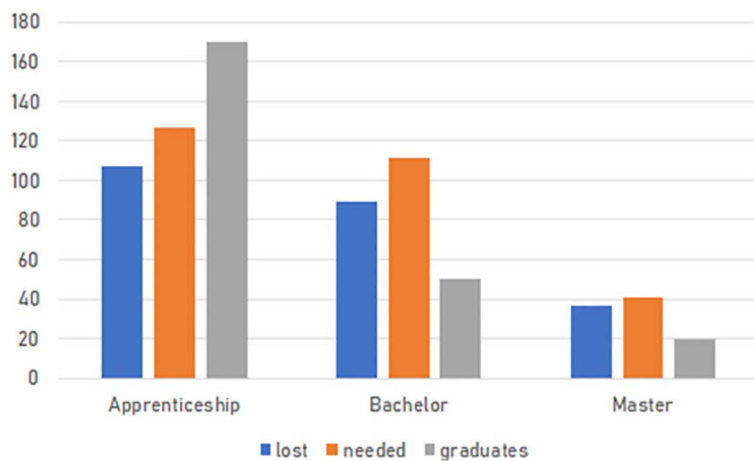


Fig. 1: Annually lost and needed workers, annual graduates in North Rhine-Westphalia (Oestereich 2012)

Tab. 1: Projection of the German workforce including total number, median age and activity rate considering low migration (Statistisches Bundesamt 2020)

	2019	2030	2040	2050	2060
Workers in 1000	43,570	40,011	37,687	35,767	33,299
Percentage	100	91.8	86.5	82.1	76.4
Median Age	44.4	43.7	44.5	44.0	43.0
Activity Rate %	70	66	66	66	65

## 2.2 Geodesy studies at German-speaking universities

In contrast to many other countries, there are multiple types of universities in the German-speaking countries. Thus, there are also different types of universities that offer study programs in surveying and geodesy. These often differ not only in their focus on teaching and research, but also in the degrees they offer their students. For many years, an eight-semester course of study at a university of applied sciences (“Fachhochschulen”) led to the degree of “Diplomingenieur (FH)” (Dipl.-Ing. (FH)), while the usually nine-semester course of study at (technical) universities, with an in-depth focus on fundamental education in mathematics and the natural sciences as well as subject-specific in-depth education, led to the broader degree of “Diplomingenieur” (Dipl.-Ing.). During the course of the Bologna-Process, which was adopted in 1999 and implemented by 2010 at the latest, and which aimed for standardization of university-degrees in 29 European countries, degrees in geodesy and surveying were also reorganized. Six-semester Bachelor of Science (B. Sc.) programs in geodesy and geoinformatics have been introduced at universities. In addition, consecutive three- or four-semester programs leading to the Master of Science (M. Sc.) degree were introduced. The former “Diplomingenieur” degree was given the same status as the M. Sc. degree.

At universities of applied sciences, seven-semester Bachelor of Engineering (B. Eng.) degree programs were created with a greater focus on practical training. Furthermore, Master of Engineering (M. Eng.) programs were created. The old “Diplomingenieur (FH)” degree was deemed equivalent to a Bachelor’s degree, despite actually being a higher-level qualification, as it did not correspond to the Master’s level (Kleusberg and Wehmann 2006).

Today, as shown in Fig. 2, there are a total of 24 universities and universities of applied sciences in German-speaking countries that offer a degree in a program typically called “geodesy and geoinformatics”. All these offer both

a Bachelor’s and a subsequent Master’s degree (Konferenz der GeodäsieStudierenden 2022). Typically, all programs at German-speaking universities include fundamental training in mathematics, physics, statistics, computer science, classical surveying, GNSS, laser scanning, photogrammetry, remote sensing, and geoinformatics. Special focus is placed on the tasks of cadastral surveying, spatial planning and the associated legal principles, which are essential for working in many areas of geodesy (Illner et al. 2018).



Fig. 2: Universities in German-speaking countries that offer geodesy study programs (KonGeoS 2022 and Arbeitsplatz Erde 2023)

Furthermore, at universities of applied sciences, there are longer periods of practical training integrated into the course of study as well as a large number of projects and practical exercises, while at universities there is a greater focus on theoretical aspects and further specialization, for example in physical geodesy, hydrography, geodetic earth observation or industrial metrology (Illner et al. 2018 and HafenCity University Hamburg 2023). As a result of the COVID19 pandemic, all courses were conducted fully or at least partially online for up to four semesters. However, as this was not feasible for all courses, some courses, mostly practical exercises but also individual lectures, were postponed or even completely canceled (Mayer et al. 2021).

### 3 Research methodology

This section will present the research methodology used in the following analysis. First, the methods used to evaluate the number of first-year students will be discussed. This is followed by the approach used to evaluate the annual KonGeoS survey.

#### 3.1 First semester student numbers

Every year, the Federal Statistical Office publishes statistics on student numbers for Germany, distinguishing between the various courses of study and the respective semester of the enrolled students. Tab. 2 shows the values for surveying and geodesy-related study programs at German universities (UNI) and universities of applied science (UAS) for a ten-year period starting from the winter semester 2012/2013, published by the Federal Statistical Office of Germany.

In the case of Austria and Switzerland, the necessary data had to be obtained directly from the universities. Since there are only universities in Austria where surveying or geodesy can be studied at, no sum of all students is built. In the case of Switzerland, there is both a university and a university of applied sciences, but for the University of Applied Sciences of Northwestern Switzerland (FHNW), all first-semester numbers were only available starting from the 2019/2020 winter semester. Tab. 3 shows the first-semester numbers of geodesy-related students for Austria and Switzerland.

#### 3.2 The annual KonGeoS survey

As part of the conference of geodesy students (KonGeoS), the working group “Young Surveyors” meets every six months. There, students from the various universities report on their experiences and observations of student number development as well as on the situation of the study and teaching and discuss possible measures. To also get an overall view of the situation and to determine the experiences of the students themselves, a first semester students’ survey is conducted at the beginning of each semester. The questionnaire is updated within the framework of the working group. There are two different versions of the survey addressing bachelor’s and master’s students. This work will mainly focus on the bachelor’s survey.

This survey is distributed to the student councils of all universities participating in the conference. Results of this survey are available for a period of ten years, beginning with the founding of the KonGeoS in 2012. As the responsible party within the conference, this survey will be sent to the student councils of the KonGeoS member universities with a request on the implementation of the survey in the context of the first semester introduction. Since these contact persons are also students and thus are replaced approximately every three years, continuous feedback is a challenge. It regularly happens that there is no response from some universities. During the pandemic, significantly fewer students participated. The number of responses also fluctuates in general. Because of this, the results of this survey have to be analyzed carefully, but nevertheless provide important insights into the development of the new generation of surveyors.

Tab. 2: First-semester numbers of geodesy-related students for all German universities (UNI) and universities of applied science (UAS) (Statistisches Bundesamt 2012–2021)

	WiSe 12/13	WiSe 13/14	WiSe 14/15	WiSe 15/16	WiSe 16/17	WiSe 17/18	WiSe 18/19	WiSe 19/20	WiSe 20/21	WiSe 21/22
UNI	1012	1660	1323	1340	1209	1080	1109	1103	927	857
UAS	1452	1661	1754	1992	1858	1802	1764	1476	1426	1224
<b>Total</b>	<b>2464</b>	<b>3321</b>	<b>3077</b>	<b>3332</b>	<b>3067</b>	<b>2882</b>	<b>2873</b>	<b>2579</b>	<b>2353</b>	<b>2081</b>

Tab. 3: First-semester numbers of geodesy related students for all Austrian and Swiss universities (UNI) and universities of applied science (UAS) (ETH Zürich 2021, FHNW 2013–2021, TU Wien 2022, TU Graz 2022)

	WiSe 12/13	WiSe 13/14	WiSe 14/15	WiSe 15/16	WiSe 16/17	WiSe 17/18	WiSe 18/19	WiSe 19/20	WiSe 20/21	WiSe 21/22
UNI AT	110	137	146	82	80	82	78	67	74	81
UNI CH	67	65	62	53	61	73	75	80	84	98
UAS CH	–	–	–	–	–	–	–	44	30	35
<b>Total CH</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>124</b>	<b>114</b>	<b>133</b>

This survey is unique in the German-speaking area in the field of geodesy in this form. This results in great interest, both from educational institutions and associations, as well as from large and small companies in the fields of surveying, geodesy and geoinformatics. In addition to person-related information, such as age or whether previous training in the subject has been completed, questions about the first point of contact with the industry and the motivation to study geodesy are of particular interest. In addition, plans for the future are questioned, e. g. whether a subsequent master's degree is planned or in which area the person would like to work after graduation.

## 4 Results and discussion

The evaluation and interpretation of the information collected is addressed in the following section. First, the progression of first-semester student numbers in geodesy is considered. In the following, these numbers are discussed, and a first outlook is provided. In addition, the annual KonGeoS survey is analyzed and more information about the background, motivation, and future of geodesy students will be considered.

### 4.1 First semester student numbers

In Germany, the number of first-semester students in the last decade reached its highest level in the years 2014 to 2016. Since then, the number of students at German universities and universities of applied sciences has been declining. Fig. 3 also shows that this trend continues during the COVID-19 pandemic. Thus, the student numbers in the winter semester 2021/2022 were the lowest observed during the last decade. In total, slightly more than 2000 students have started at German universities and universities of applied sciences in the winter semester 2021/2022. Universities account for around 41 % and universities of applied sciences for 59 %. This ratio has remained almost constant in recent years.

For some years now, universities and universities of applied sciences have recognized the decline in student numbers. Professional associations, authorities, engineering,

and specialized companies have also become aware of this trend. As a result, actions and campaigns have been launched to raise awareness of the geodesy profession and to recruit high school graduates, as well as graduates of apprenticeship programs to start a bachelor program in geodesy. Despite these efforts, no trend reversal could be achieved in Germany so far. In order to be able to meet the high demand of the labor market for specialists in geodesy in the future, it seems to be important to have increasing student numbers in Germany soon. Geodetic study programs are becoming smaller in Germany due to declining student numbers. So, it becomes difficult in the long term to justify the many study locations where geodesy is taught if the number of students continues to fall in the future.

At the two Austrian universities in Vienna and Graz, the numbers of new students were relatively high in the years 2012 to 2014. Fig. 4 shows more than 100 new geodesy students starting in the winter semester of 2012. In the winter semester of 2014, there were even more than 140. In the following years, the numbers were at a significant lower level.

Since the winter semester 2015/2016, about 80 students enroll in geodesy at Austrian universities every year. Because of the development of the student numbers in recent years, constant numbers in the near future can be expected. However, it would be better if the number of students in Austria would increase again in the next few years.

A different development can be seen at the German-speaking universities in Switzerland. Fig. 5 shows the development at the technical university in Zurich (ETH Zurich) and the university of applied sciences in Muttenz (FHNW). Here, a positive trend can be seen for student numbers of ETH Zurich. Until winter semester 2015/2016, the numbers are slightly declining. But since then, significantly more students started in geodesy every year. Even

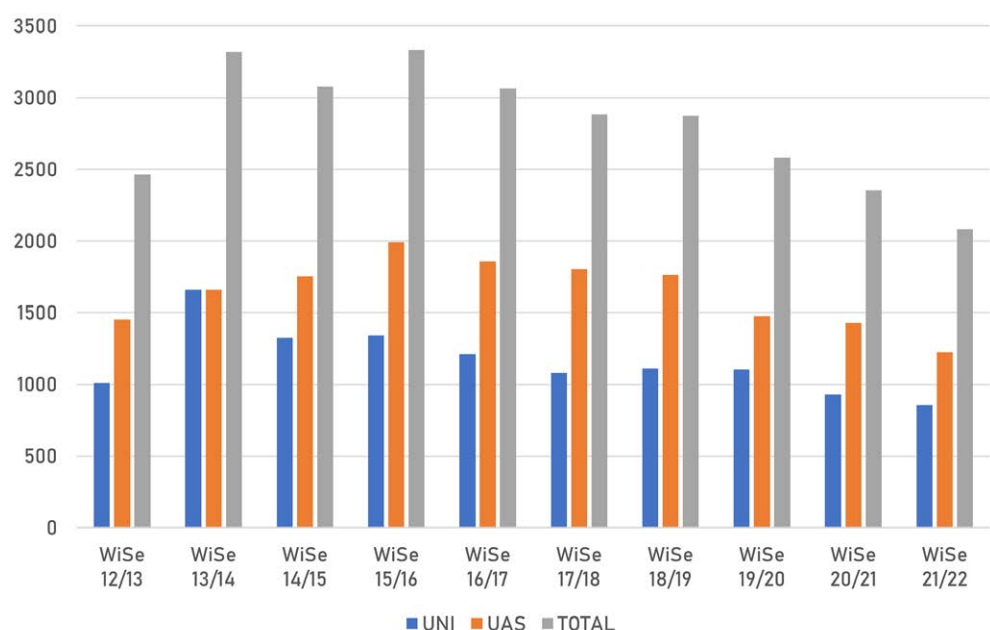


Fig. 3: First-semester geodesy students at universities (UNI) and universities of applied science (UAS) in Germany (Statistisches Bundesamt 2012–2021)

during the COVID-19 pandemic, the numbers have continued to rise. For example, in recent years, about 120 students have consistently started at ETH Zurich and FHNW, with nearly 100 first-semester students at the Zurich technical university alone. The majority of about 70 % are at ETH Zurich and the remaining 30 % belong to FHNW. Such a positive trend is needed to bring a sufficient number of new surveyors to the Swiss labor market.

It should also be mentioned that usually only a certain percentage of new enrolled students are able to successfully complete their studies. The number of new enrolled students should therefore not be equated with the number of graduates.

It is significant to note that the development of student numbers in Germany, Austria and Switzerland differs considerably. While the numbers in Germany are decreasing and remaining rather constant in Austria, there has been a growth in Switzerland in recent years. But all countries have one thing in common, they want to build a strong generation of young surveyors with high student numbers and well-qualified graduates and thus be well prepared for the future in geodesy. In order to achieve this, many efforts are being made to bring geodesy more into the public eye and, especially, to reach the target group of high school students.

#### 4.2 The annual KonGeoS survey

The most recent iteration of the annual KonGeoS survey was conducted in October 2022 and comprised 304 first-semester students from 17 out of 22 member universities of KonGeoS. The remaining 5 universities did not provide a response.

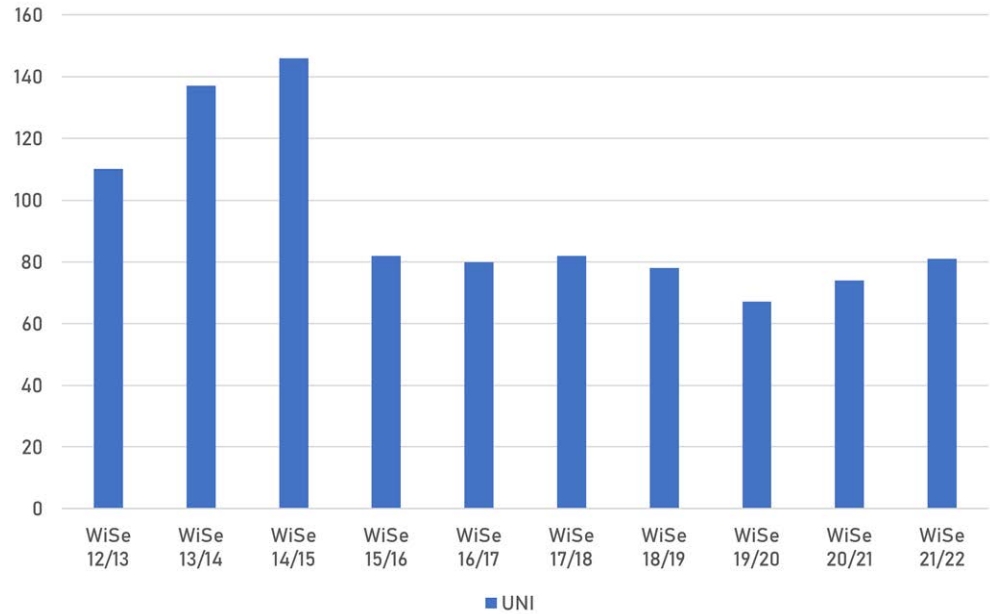


Fig. 4: First-semester geodesy students in Austria (TU Wien 2022 and TU Graz 2022)

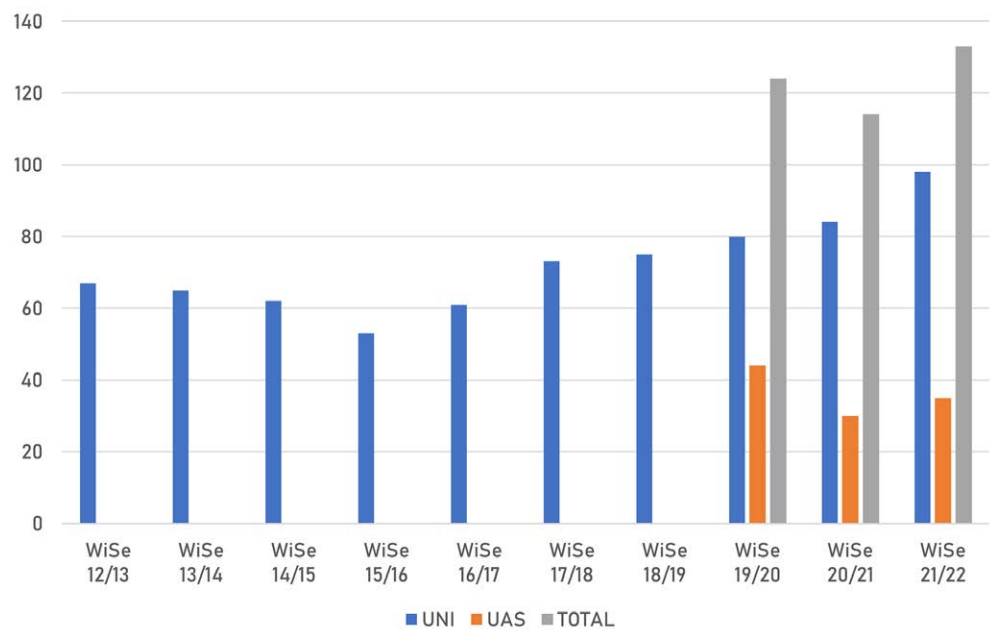


Fig. 5: First-semester Geodesy students at universities (UNI) and universities of applied science (UAS) in Switzerland (ETH Zürich 2021 and FHNW 2013–2021)

This section will address the following questions of the survey in particular:

- How did the students find out about the study program?
- Do the students work while studying?
- Have the students completed an apprenticeship before starting their studies?
- What are the students' expectations for their future after graduating, regarding the field of work and the employer? Do they plan to start a master's degree afterwards?

The first challenge presents a fundamental issue: Surveying does not have the same level of recognition as other disciplines (e.g. Business Administration, Law) and often requires explanation. This is why the first-semester students

were asked about their prior exposure to geodesy and surveying and the reasons behind their choice of this academic program. Respondents were allowed to provide multiple answers.

As depicted in Fig. 6, a substantial number of students were introduced to the academic program through relatives, acquaintances, and general websites, as well as through their school or future employers in surveying offices or companies. Campaigns and initiatives, some of which are supported by professional associations, have not had the desired impact.

Professional associations tend to play a limited role in promoting the field and related training programs. Information events and action days are typically limited in scope and reach fewer young people compared to general websites. Some social media channels are still under development and may have a greater impact in promoting geodesy in the near future. The “Weltvermesserer” campaign, which was launched in August 2020, is seen as a source of hope for many institutions, although few first-semester students cited it as a reason for pursuing geodesy studies. Personal contacts, in addition to potential future employers, continue to have the most significant influence on students’ decisions to study geodesy.

The next aspect of the survey focused on the number of students who are employed while studying, with a particular emphasis on whether they work in the field of surveying.

Fig. 7 provides a visualization of the students’ employment status during their academic program. 57.8 % of the participating students hold jobs alongside their studies and 41.9 % are employed in the field of geodesy. While working students are primarily hired for labor purposes, companies see dual students as their future workforce and provide support for their professional development. In both cases, students gain practical experience in their field of study while also financing their education. The survey results indicate that many first-semester students are interested in this type of work arrangement, and that companies and offices are increasingly willing to participate. Through the dual student model, they hope to secure the services of skilled young professionals for long-term positions prior to their entry into the workforce.

Students who have completed an apprenticeship in the field of surveying have received a more specialized technical education in the subject, although it is not a requirement for enrollment. The survey also included a question about prior completion of an apprenticeship.

Fig. 8 presents the results of this question. Approximately one-third of the students had completed an apprenticeship in the field of geodesy prior to their academic studies. Only a small number of them changed their field of study from their previous training. Given the high demand for higher education in the form of university studies, it raises the question of whether an increased number of appren-

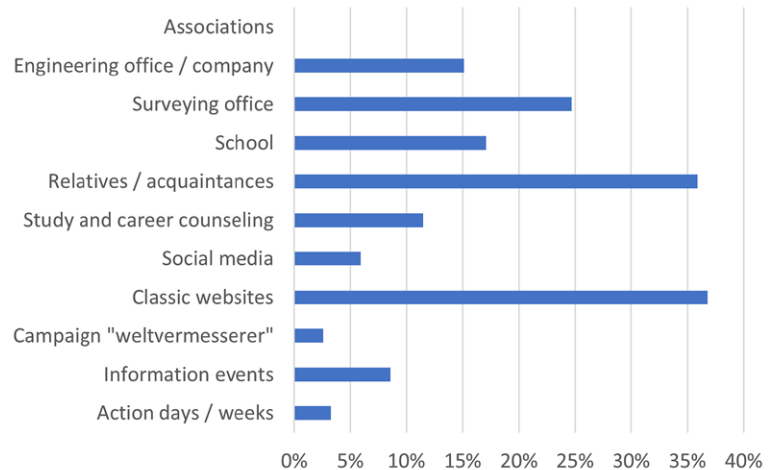


Fig. 6: Students’ points of contact with Geodesy according to the KonGeoS survey (Total of 304 participants)

ticeships would lead to a higher enrollment in the academic program.

Further education opportunities, such as obtaining a Master’s degree, were also explored in the survey. 20.4 % of the participants answered “yes” to pursuing a Master’s degree, while 21.7 % answered “rather yes”. Only 6.3 % indicated that they were certain that they would not continue with a Master’s degree, while 17.8 % answered “rather not”.

The choice of degree also depends on the desired profession after graduation. The survey addressed this by asking two more specific questions: one about the desired future employer and one about the desired field of work. Multiple options were again allowed for both questions. As shown

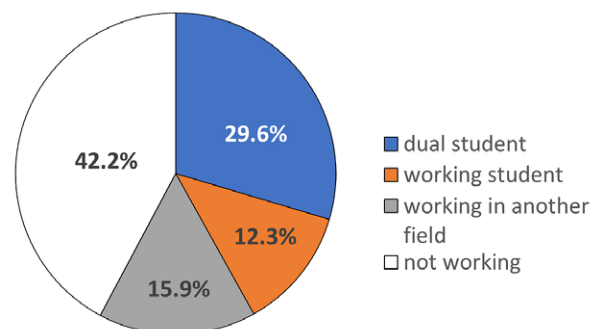


Fig. 7: Working status of Geodesy students according to the KonGeoS survey (Total of 304 participants)

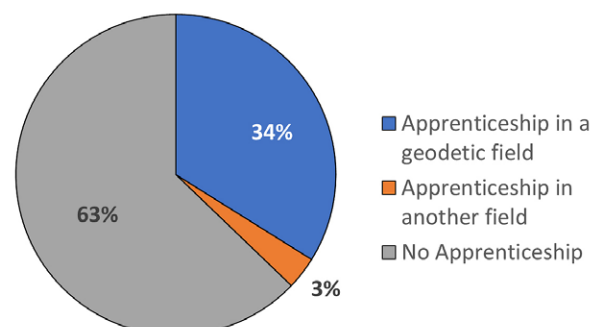


Fig. 8: Students with a previous apprenticeship according to the KonGeoS survey (Total of 304 participants)

in Fig. 9, half of the students expressed an interest in working in the public sector. Engineering offices and working as cadastral surveyors were also popular among students. In contrast, self-employment, jobs at universities, software companies, and positions in the industry play smaller roles in the plans of first-semester students.

Employment with the state or local government offers greater job security and regular working hours. Obtaining a Master’s degree is particularly advantageous in this regard, as it impacts the level and classification of pay based on qualifications. Fig. 10 shows the results of the related follow-up question. Two-thirds of the students envisioned themselves working as classic surveyors. Conversely, mechanical engineering, BIM, and land consolidation had lower popularity among students, and hydrography was not very attractive to them.

The popularity of engineering offices and public appointed surveyors aligns with the result of the second question, where classic surveying is more favored than more contemporary fields. This can be attributed to the initial perception of first-year students regarding their studies, which typically centers around classic surveying. However, as they progress through their studies, they may become more familiar with areas such as remote sensing or BIM, which are taught to varying degrees at different universities. It is worth noting that surveying is a subject that is taught comprehensively across all universities, but hydrography is only offered at a few universities near coastal cities.

## 5 Further findings

### 5.1 Status of Geodesy in an international perspective

The FIG Working Week 2023 in Orlando, Florida, USA, where this study has been presented, brought a unique insight regarding developments and perspectives of geodesy studies at different universities and in various countries. There was significant international interest in the presentation of the situation in the German-speaking world. In particular, the Q&A session was used to exchange views on the current status of the programs and the seemingly universal issue of too few young talents interested in geodesy. In addition, the desire was expressed for a further analysis regarding the development of the results with a comparison of surveys carried out with first-semester students and graduates. A forthcoming survey will provide further insights and will be published in the near future.

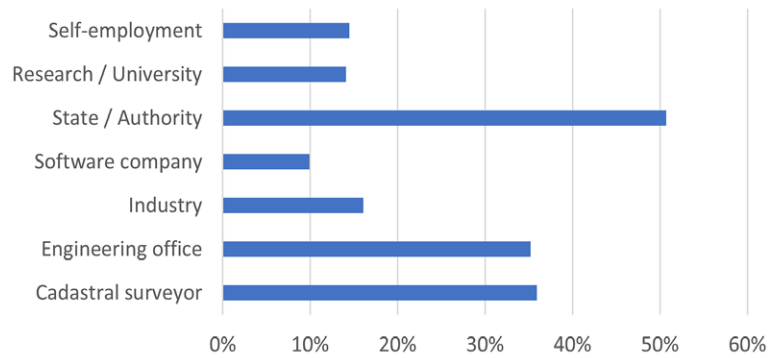


Fig. 9: Target employments of first semester bachelor’s students according to the KonGeoS survey

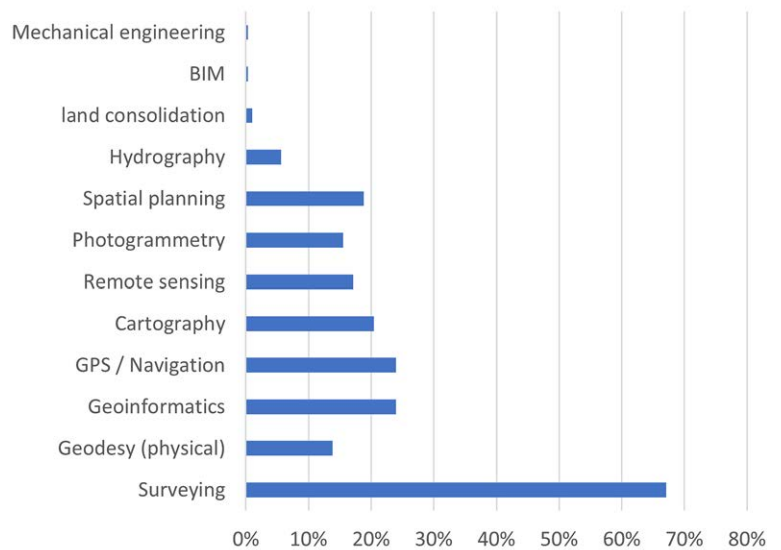


Fig. 10: Target working fields of first semester bachelor’s students according to the KonGeoS survey

In the discussions with participants of the FIG Working Week, it became clear that the problem of young talents in surveying is not limited to German-speaking countries, but also exists in most other nations, such as the USA and Australia. Universities and surveying companies in these countries are urgently looking for qualified students, both nationally and internationally.

A higher level of public awareness on an international level is sought by universities in order to increase interest in surveying professions and to acquire more students.

According to 2019 data from the German Federal Employment Agency, the average age of surveyors and cartographers in Germany is 44 years (Bundesagentur für Arbeit 2019). Interestingly, it was reported during the FIG Working Week that the average age worldwide seems to be roughly 10 years older. This shows the urgency to address the young talent problem to prevent an aging workforce. Participants from the U.S. and Australia in particular brought up their specific challenges with young talents. This highlights the relevance of cross-cultural exchange to share ideas and solutions to promote the next generation of surveyors.



At this year's IGSM (International Geodetic Student Meeting) in Valencia, the issue of too few students was also addressed. A forum discussion showed that this is a general issue, and our profession does not receive sufficient public attention, which also seems to be a factor in the international context. In contrast to the German-speaking countries, the number of universities offering a program in geodesy is much more limited. Although there are different structures, most European countries are also aware of this problem and those, who are responsible, actively try to find solutions. Most participants agreed that this is not a regional problem, and that closer cooperation should be sought. The international exchange should also be promoted to find solutions for the fact that there are too few young talents. Publication of the planned alumni-survey results will provide additional insights and pave the way for future strategies to strengthen international interest and engagement in surveying.

## 5.2 Existing campaigns for promoting the profession

As the recruitment of surveying students is a well-known challenge in the German-speaking area, various initiatives have been established to increase the number of young people entering the surveying field. A great example is the "Weltvermesserer" campaign, an expansion of the "Arbeitsplatz Erde" campaign, which has been running for over a decade. "Weltvermesserer" is a newly coined term specifically created for this initiative, based on the German translation of "world surveyors". It was initiated by the geodesy interest group in February 2020 and officially launched in August of the same year. This interest group comprises three German surveying associations: "BDVI", "DVW", and "VDV". Further public as well as private institutions also support the campaign (BDVI 2021).

To enhance their online presence, a social media manager was hired. In February 2021, the website [www.arbeitsplatz-erde.de](http://www.arbeitsplatz-erde.de) underwent a revamp, adopting "Weltvermesserer" design. The design is oriented towards the target audience, which primarily consists of individuals aged between 14 and 19 years. These young people are considered to be in a phase of their lives where they are making decisions about their future careers (Weltvermesserer 2023).

After analyzing the main channels to effectively reach this target group, Instagram was selected as the primary platform because it is the most used platform among the target audience suitable for a campaign (Rybka and Nuncic 2021).

In addition to the "Weltvermesserer" campaign, there are numerous actions at the state level in Germany, mostly organized by the state offices for surveying, universities, and professional associations. These campaigns usually organize a so-called "Day of Geodesy", although often not on the same date, or a "Geodesy Action Week" and are usually regularly present at job fairs to attract young talents. One example is the campaign "geodäsie.nrw", which

organizes the annual "Geodesy Experience Day" in North Rhine-Westphalia and appears at many study and training fairs to increase awareness for the profession (geodäsie.nrw 2023).

A different approach is being taken in Baden-Württemberg with the "Geodesy Action Week". Here, numerous private companies have joined the State Office of Surveying, the universities and the professional associations in hosting events throughout the state as part of this week-long effort. As part of this, numerous high schools are also visited to introduce students to the surveying profession (Aktionswoche Geodäsie 2023).

On the international level, the initiative "Get Kids into Survey" was established in 2017. The target group is significantly younger which leads to a different way to address them. Their main products are comic books, posters, coloring sheets, homework projects and quizzes that communicate surveying content in a playful manner. In their scenarios, surveyors are solving problems in many different situations. Most of the materials are in English but certain posters are already translated into German and other languages. During the conversation with ambassadors on-site in Orlando, further translations were suggested. In addition, they are establishing a world-wide network of brand ambassadors that are spreading the products among their surroundings (Get Kids into Survey 2023).

## 6 Conclusion

In general, Germany has difficulties in finding qualified workers. One reason for this is the declining birth rate. The surveying sector is also struggling with this problem. Although there are enough surveyors with completed apprenticeships, there are too few students at both (technical) universities and universities of applied sciences. And the number of these are still increasingly declining in Germany. But that may also be partly due to the Corona pandemic. The number of students in Austria are relatively stable, and in Switzerland, they have risen in recent years. The declining numbers have been observed for some time, and many attempts have been made to respond, but so far without great success. For this reason, among others, KonGeoS also conducts a survey every semester to ultimately determine how to attract the next generation of surveyors in the future. Even though this survey is not one hundred percent reliable, because not all students participate, some conclusions can be drawn from it.

In the future, the profession needs to be brought further into the public eye to make it better known and to ensure that the programs at the different universities continue to be provided nationwide. The conference of German-speaking geodesy students KonGeoS hopes to be able to contribute to this.

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