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# The teacher shortage in Sweden: an unexplored area with various views on causes and solutions

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The background of this study is the accelerating teacher shortage in Sweden. Various stakeholders have expressed their views on the issue, but not those working with pupils. Therefore, this study is focused on seven professional groups who responded via an online survey to statements about causes of and solutions to the teacher shortage. The statements had previously emerged from national and regional dialogues with policy makers. The results showed that most of the statements were relevant, but not the imbalance between men and women or views on knowledge and teacher certification. Regarding solutions, respondents agreed with most of the proposed solutions, but not more independent schools or shorter teacher training programs. Many significantly different perceptions also emerged between stakeholders regarding the causes of the teacher shortage. The perceptions of student health staff differed significantly from those of the other stakeholders. Compared to the other groups, they considered the teacher shortage to be due to curriculum reforms, conditions for teachers, drop-outs from the teaching profession, the number of pupils, and the view of knowledge. Principals and qualified teachers also showed different perceptions of the media debate and workload as causes of the teacher shortage. Regarding solutions, the views of authorized and unauthorized teachers differed. The study utilized wicked problem (what the problem is represented to be) and coordination theories as theoretical frameworks. The results confirm the usefulness of wicked problem theory. Regarding causes and possible solutions, the multiactor design of this study shows variation in representations of the problem. This variation in views on which solutions are preferable/most important provides a basis for the need for further analysis and public discussion of the teacher shortage, as well as concern about the possibilities for coordinated efforts.

KEYWORDS

**causes, significant differences, solutions, Sweden, teacher shortage, wicked problem**

## 1 Introduction

There is hardly any doubt that there is a shortage of teachers in Sweden. There seems to be great agreement on this, highlighted by representatives of trade unions, the National Agency for Education, responsible politicians at municipal and national levels, government representatives, school principals, teachers, and researchers (Boström et al., 2021). There is widespread agreement on both the seriousness of the teacher shortage and the importance of having trained teachers in schools for students to have the best possible conditions for learning. However, actors' views of the teacher shortage differ, as do views of its causes, how the teacher shortage should be remedied, and who can best act/have the best decision-making powers in the situation that has arisen (Berglund and Bostedt, 2023).

The acute shortage of teachers has been visible in the media in recent years. For example, some schools have had to close due to a lack of qualified teachers (Lärarförbundet, 2022),

pupils are sent to other schools for certain lessons to be graded by qualified teachers, and popular upper secondary education programs are canceling admission for certain groups of pupils. In sparsely populated areas, some subjects are sometimes taught through digital distance learning by qualified teachers from elsewhere. The consequences of the teacher shortage are also highlighted in various ways in the media. One warning is that some subjects (science subjects) will be "wiped out" (Jansson, 2015); another is that the shortage of teachers, especially in northern Sweden, may threaten companies' ability to recruit experts from other parts of Sweden and the rest of the world (Kungl. Ingenjörsvetenskapsakademien, 2020). There is a general perception that the teacher shortage also has a negative influence on society's development as a whole.

In the public debate, the shortage of teachers is rarely nuanced in terms of differences related to teacher categories or differences between regions. This applies nationally and internationally; teacher shortages are an international problem (García and Weiss, 2019; See and Gorard, 2020). Federičová (2020) showed large regional differences in Europe regarding teacher turnover. In southern Europe, teacher turnover is relatively low (about 15–16%), while the corresponding figure for northern European countries such as Sweden is up to 39%. Skolverket (2021) stated in a teacher prognosis that "There are major differences between different parts of the country in terms of the need to recruit more teachers and preschool teachers" (p. 6). The differences are affected by the estimated number of children starting or attending school and the opportunities to recruit teachers in sparsely populated and socioeconomically vulnerable areas. The teacher shortage in Sweden is particularly acute for subject teachers in Grades 7–9 and vocational teachers; there is also a projected shortage of teachers in preschool and primary school teachers in Grades 4–6 (Skolverket, 2021). In a review based on the Labour Force Survey (Arbetskraftsbarometern), Berglund and Bostedt (2023) have also shown that the need for special needs teachers and those for school-aged educare students remains high.

Teacher shortages are a national and international problem with many possible and undesirable consequences. UNESCO (2016, 2023) and the European Commission (2019) have long warned of the alarming international teacher shortage. In Sweden, for example, Skolverket (2017, 2019, 2021) and Statistiska Centralbyrån (2017a,b) have highlighted the problem. However, a review of ongoing and current research on the issue shows that nationally, it is quite limited, and most research on the phenomenon seems to have been conducted in the United States. Craig et al. (2023) have advocated for contextualizing the teacher shortage situation, creating a long-term vision of how to implement teacher reforms and promoting the value of the teaching profession. They argued that much of the teacher shortage has been caused by "historical missteps" (p. 211) due to reforms and the lack of vision to improve the teaching profession.

This description of the current situation regarding teacher shortages justifies in-depth studies in this area. This can be done in several ways; studies of the perspectives of individual actor groups (decision-makers such as politicians, school heads, or principals) have dominated. In this study, a multiactor perspective was chosen to investigate whether (and if so, how) perspectives on the causes of and possible solutions to the teacher shortage differ between relevant actor groups. It is reasonable to assume that the greater the heterogeneity of perspectives on the situation, the greater the challenges in addressing the issue in a way that is effective, acceptable, or desirable for all involved. In fact, heterogeneity in perceptions of the problem and possible policy action may be part of the problem itself or create paralysis in the face of necessary action. This is based on the assumption that there is already a general and accepted perception that something must be done (see previous paragraphs). The question is, then, whether the possible causes of and solutions to the teacher shortage are burdened by major differences in the perspectives of the relevant groups of actors or whether there is a consensus on both the causes and possible measures to solve (fully or partially) the situation. This study is focused on just that—the question of homogeneity or heterogeneity in the perspectives of a number (though not all) of the relevant stakeholder constellations regarding the causes of and possible solutions to the issue of teacher shortages. Such studies have been few, which is why this study can contribute to the overall knowledge of how teacher shortages as a social problem can be understood and addressed.

## 2 Theory approach

The study's theoretical starting point is wicked problem theory to analyze and understand the phenomenon of teacher shortage. Wicked problem theory (Rittel and Webber, 1973) addresses social issues that are serious, complex, and difficult to solve due to contradictory and changing demands or value conflicts. Important features of the wicked problem theory are causal pluralism regarding the existence of the problem, interdependence between several important causes and solutions, the fact that efforts to address/solve the problem can lead to unexpected consequences and constitute a changing problem of a social nature, the requirement for interorganizational coordination, the fact that it affects individuals' behaviors and perceptions, and the characterization of problems by policy failures over a long period. All of these points have been shown to be applicable to the teacher shortage phenomenon (Blanco et al., 2023; Berglund and Bostedt, 2023; Boström et al., 2021), making the theory useful for a comprehensive analysis and understanding of the problem area. Teacher shortage is a complex problem, and understanding and addressing the problem requires coordinated efforts. Therefore, it is a misguided illusion to believe that individual efforts and/or constellations of actors will solve the problem. This conclusion—that the problem involves many actor constellations, and that knowledge is needed to understand whether there are major similarities or differences in perceptions of causes of and possible solutions to the issue of teacher shortages—justifies this study and its analyses and conclusions.

The wicked problem theory's assumption that complex societal problems are often linked to contradictory and changing demands or value conflicts implies that the phenomenon affects many actors/actor constellations. In relation to the issue of teacher shortages, these relevant actors are citizens (pupils and guardians), social partners (employers, employees, and trade unions), and societal representatives (decision-makers and clients of various kinds). We argue that the wicked problem theory can be linked to Bacchi (2009) theory of "what the problem is represented to be" (WPR). Different understandings and perspectives on the teacher shortage problem (representations; Bacchi, 2009) constitute one of the two areas of inquiry on which this study focuses.

The second area of inquiry in this study, possible actions for the problem, concerns how solutions can best be defined and implemented. To address this question, it is appropriate to complement the wicked problem theory and WPR with a third theoretical approach—coordination. This study is based on perceptions of problems and possible solutions. We do not study how solutions are actually implemented. However, we believe that analyzing the conditions for effective action in the form of similarities or differences in professional groups' perceptions about possible measures is important and interesting to study.

Coordination is a theoretical concept taken from organization and interorganization theory (Abrahamsson and Andersen, 1996; Alexander, 1995; Roger and Whetten, 1982). In this case, however, it is not applied to institutions/organizations, but to groups of actors. The concept of coordination has been defined and is used in this study as the possibility of systematic linkage between actors' decision-making (Lindblom, 1965). Coordination is then made possible via conditions for mutual adaptation between actors/actor constellations (individual decision-making) or a conscious interaction between actors in their decision-making (joint decision-making; Alexander, 1995). In this article, coordination as a theoretical concept relates primarily to our interest in the second of the question areas that the study is focused on—what to do about the problem of teacher shortages. The concept can be said to address the classic theme of implementation theory: Coalitions of interests/coinciding power interests can exist (SOU, 1990) that can enable or prevent effective problem-solving based on power, position, or special interests. Therefore, action on complex social problems requires an analysis and action strategy based on knowledge of similarities or differences in perceptions and values of the problem and possible solutions. In this study, representation is used as a theoretical concept in relation to perspectives on causes and conditions for coordinated efforts in relation to possible or necessary action. This approach also relates to a social problem, the shortage of teachers, which exhibits many of the characteristics of a wicked problem.

Based on previous research and dialogue meetings with regional and national policy actors relevant to the problem area, such as researchers, school leaders, trade union representatives, and politicians, an online survey was constructed consisting of 16 statements about the causes of the teacher shortage, 13 statements about possible solutions, and two statements about time perspectives for solving the teacher shortage. These statements were developed through a national and a regional conference with various policy actors in autumn 2021. This article aims to describe and analyze the significant aspects of the causes of and possible solutions to the teacher shortage as stated by the professional actors (i.e., those who have concrete everyday experience of the teacher shortage and its consequences).

Based on the resulting 29 statements, we sought answers to the following research questions:

1 What are the reasons for the teacher shortage according to eight relevant stakeholders in the field?
2 What are the solutions to the teacher shortage according to eight relevant stakeholders in the field?
3 Are there differences and similarities between the various relevant stakeholder groups regarding causes and solutions, and if so, in what respects?

## 3 Previous research

The teacher shortage appears to be a major societal problem in most countries, including Sweden (See and Gorard, 2020). The world needs at least 69 million new teachers to achieve the education goals of the 2030 Agenda (UNESCO, 2016). Internationally, the teacher shortage has been commented on since the Second World War, but the shortage still exists and has accelerated more than 70 years later (Swanson and Mason, 2017). In the United States, the teacher shortage has been a recurring problem (Aragon, 2016; Darling-Hammond and Podolsky, 2019) since the mid-1930s. It is referred to as a chronic teacher shortage (Carothers et al., 2019). The causes appear to be several factors, such as too few new teacher graduates in various fields, teacher turnover, changes in educational programs, lack of administrative support, teacher salaries, and the attractiveness of the profession in general and in specific locations (Sutcher et al., 2016; García and Weiss, 2019). Politicians have been criticized for seeing teacher recruitment as the main way to address the problem, instead of also focusing on measures to retain existing teachers (Carver-Thomas and Darling-Hammond, 2019).

Teacher shortages are also reported in England, and policies have been criticized, specifically in that the negative effects of the various policy-initiated changes are not sufficiently considered and that "teacher shortages are partly created by government policies themselves" (See and Gorard, 2020, p. 416). These researchers suggest an independent review of teacher supply. In Australia, authorities have pointed out that teacher shortages have increased due to factors such as the status of the profession, workload, working conditions, pay, and regional differences (Australian Government, 2022). In Europe, teacher shortages exist in almost all countries (Federičová, 2020). The problems are similar in volume and causes in Sweden. The various causes of teacher shortages listed can be summarized by Blanco et al. (2023) conclusion that structural, social, and cognitive influencing factors need to be considered.

In Sweden, the issue of teacher shortages has attracted some attention in the last decade. Teacher supply is recognized as "a challenge of historic proportions" (Bertilsson, 2018, p. 1). There are many interconnected factors of the teacher shortage in Sweden. Among other aspects, researchers have mentioned changed conditions, low status, the quality of teacher education, early dropouts from the profession (Håkansson Lindqvist et al., 2022), numerous reforms in the school area, varying governance philosophies, changing teacher education programs (Boström et al., 2021), and negative attitudes about the profession in the media and society (Boström, 2023; Grannäs and Frelin, 2019). It is clear that the teacher shortage must be viewed from a more long-term perspective, emphasizing the complexity of the problem and the covariation of influencing factors over time for teacher categories, as well as how factors relate to each other. Berglund and Bostedt (2023) described a historical review, and an analysis based on the wicked problem theory (Rittel and Webber, 1973) using the Labour Force Survey's publications (Arbetskraftsbarometern) from 1973 to 2022 regarding the shortage and supply of teachers over the past 50 years. The 50-year review clearly shows that the phenomenon of the teacher shortage is not a suddenly emerging problem. Due to its

complexity, the problem is characterized by policy failures over a long period. Berglund and Bostedt concluded that Sweden's great variation in actors' perceptions of schools' problems and possible solutions has created uncertainty and a lack of clarity in the school world in terms of goals and governance ambitions. "It is likely that several of the school reforms implemented to address various perceived problems in the education system have simultaneously given rise to other problems" (Berglund and Bostedt, 2023, p. 205). While the teacher shortage is recognized in various ways, there are also initiatives to ease the situation, for example, in the form of temporary teachers (Axelsson, 2021), full-time mentors (Gardsten and Fonsceca, 2019), and teacher assistants who provide teachers relief from their duties (Lindqvist, 2020).

# 4 Methods

## 4.1 Empirical data

The study's empirical material comprised responses to a questionnaire from 605 respondents: 109 (18%) men, 491 (81%) women, and five other/do not want to answer regarding gender (1%). The selection of informants is based on the professional groups that interact with teachers and students in everyday life, in the real context. The professional groups included in the questionnaire were trained teachers, untrained teachers, student health care staff (nurses, counselor, special education teacher, school psychologist), other staff (e.g., assistants, nannies), principals, teaching staff at higher education institutions, and student teachers[1] (student teachers are included here in the concept of professional groups in view of future teaching). The sample of respondents thus included academic and practicing professionals as well as student teachers. The criteria for selecting professional services were based on the most common professions in schools and academia related to teachers (Table 1).

The aim of the study was to map perceptions of the teacher shortage and its possible solutions from various professional categories involved in the teaching profession. To explore their perceptions, material was collected through a questionnaire with open and closed questions. This article presents the quantitative results of the survey.

The empirical material that forms the basis for our analysis was obtained in the spring of 2023. Data was collected using a web-based survey administered via a link to the Netigate survey tool.[2] The survey was followed by a message explaining the purpose of the study and that participation was voluntary and anonymous.

In addition to background information such as age, gender, professional status, and years of work in the school/academy, the questionnaire consisted of 16 statements about the teacher shortage based on previous research (Boström et al., 2021) and 13 statements about how the teacher shortage can be solved. The latter questions were based on two dialogue meetings with regional and national actors as well as previous research, and they included two questions on whether the shortage can be solved in the long and short term. Before the questionnaire was sent out, it was tested by six people in various positions in schools/academia and reviewed in an academic forum. The study followed the Swedish Research Council's rules and ethical recommendations for studies in social science research (Vetenskapsrådet, 2017).

TABLE 1 Frequency of occupational positions.

| Professional position | Frequency | % |
|---|---|---|
| Trained teachers | 324 | 53 |
| Untrained teachers | 33 | 5 |
| Student health staff | 44 | 7 |
| Other staff | 35 | 6 |
| Principals | 72 | 12 |
| Teaching staff in higher education | 51 | 8 |
| Student | 75 | 12 |
| Other | 30 | 5 |
| Total | 605 | 100 |

## 4.2 Instruments and analysis

As noted, the online survey consisted of 16 statements on the causes of the teacher shortage and 13 statements on possible solutions (plus two on the time frame for resolution). All statements were rated on a 4-point scale, from 1 (*strongly agree*) to 4 (*disagree*). Participants also had the option to answer "I do not know." In the following text, two percentage distributions are described; the first shows the percentage distribution with "I do not know" answers included, and the second ("valid percentage") with "I do not know" answers removed. This approach establishes the overall response rate and the percentage distribution of the "I do not know" responses.

Data were analyzed using SPSS Statistics (version 27). Frequency analyses were conducted to describe the survey questions. Frequencies, means, and medians were used to analyze individual statements. The Mann–Whitney U-test was used as a measure of comparison between the eight occupational groups. Results are presented using descriptive statistics and significance testing. Chi-square tests were performed on each statement to compare the occupational roles, as "I do not know" was also included as a response option.

## 4.3 Methodological discussion

Like all similar studies, the results presented here should be seen as snapshots. Perceptions of teacher shortage causes and possible solutions may change over time and depend on context and topics (Boström et al., 2021; Skolverket, 2021). One limitation is that the study is based on perceptions, meaning they are not actual causes, and this is taken into account in the

1 Respondents categorized their professional positions. This means that they chose the position that they thought best described their current position.

2 www.netigate.se

analysis and conclusion. Repeated measurements and longitudinal studies are required to deepen knowledge of the problem. The study is limited to eight occupational groups, and the results are only valid for those included in the study. This was an adequate design choice for the study (cf. Hassmén and Koivula, 1996). A strength of the chosen statistical method is that the test is not affected by extreme values, which can occur in parametric tests. A weakness is that it requires more interpretation of the results (i.e., it is not as clear about conclusions of the material as parametric tests; Siegel and Castellan, 1988).

# 5 Results

The following section presents the results for all respondents' rankings of the statements and the items answered with "I do not know." It then presents the results regarding significant differences between occupational groups and interpretations for each subresult.

## 5.1 Ranking of the response options

The percentage distribution of how respondents answered the 29 statements is presented in Table 2. The table shows the percentages of respondents who marked "*strongly agree*" or "*agree to a large extent*"; that is, we have merged both of these responses in the table's presentation of results. As shown in the table, 50% or more of respondents agreed with 19 of the 29 statements in the online survey, and 75% or more of respondents agreed with 11 of the 31 statements. Broken down by question area, more than 50% of respondents agreed with 10 out of 16 statements on the causes of teacher shortages and nine out of 14 statements on how to address teacher shortages. Furthermore, only 17% of respondents indicated that causes for the shortage other than those included in the questionnaire were applicable. Similarly, only 17.6% of respondents stated that options other than those given in the survey were needed to address the teacher shortage. We conclude that many of the statements in the online survey show good validity in relation to answering the knowledge questions in this article (i.e., various policy-relevant groups' perspectives on the causes of and solutions to the teacher shortage).

Table 2 indicates whether respondents agreed or disagreed with the statements. Consequently, disagreements are not reported. Table 3 shows the distribution of disagreements per statement. With two exceptions, the percentage of "I do not know" responses varied between 0.7%% and 18.7 in the two question areas concerning the causes and options for addressing teacher shortages. The exceptions are the response options "Teacher shortage is due to other things" (75.4%) and "Other things are needed" to solve the problem (77.1%). Because the respondents were not able to define other problem areas for the teacher shortage or ways to solve the teacher shortage than the statements in the questionnaire, we interpret the answers as a confirmation of the validity of the questionnaire for our study.

TABLE 2 Proportion (%) who fully or strongly agree with the statements.

| Teacher shortages are due to … | |
|---|---|
| … changing and deteriorating conditions for teachers | 93.4 |
| … deteriorating status | 93.1 |
| … policy reforms at the structural level (e.g., municipalization) | 84.4 |
| … dropouts from teacher training and the profession | 79.6 |
| … the deprofessionalization of the profession | 76.7 |
| … an increased number of pupils | 72.4 |
| … the risk of teachers being exposed to violence (mental or physical) or abuse | 70.2 |
| … the negative media debate | 68.2 |
| … different governance philosophies | 64.8 |
| … the general crisis in welfare | 52.9 |
| … teacher training reforms | 49.8 |
| … curriculum reforms | 43 |
| … an imbalance between men and women | 31.8 |
| … the view of knowledge that permeates the curriculum | 25.6 |
| … the requirements of the teaching license | 16.4 |
| There are other reasons for the shortage of teachers | 17 |
| **How to address the teacher shortage** | |
| Raise the status of the teaching profession | 96.2 |
| Higher wages | 93.6 |
| Another form of governance (the state as school authority) | 82.4 |
| A different media debate on the teaching profession | 79.6 |
| Focus on facilitating students' ability to absorb learning during the school day | 79.1 |
| Better opportunities for professional development in the profession | 75.6 |
| Improve teacher training | 68.7 |
| Fewer independent schools | 60.2 |
| Faster and better validation of knowledge/skills | 54.4 |
| More training places for teachers | 42.2 |
| Intensive or short-term teacher training | 25.6 |
| Other things | 17.6 |
| More independent | 3.8 |

The statement with the highest "I do not know" response regarding the causes of the teacher shortage (apart from the one commented on previously) was the question on governance philosophies. We interpret the responses as meaning that this statement could have been exemplified in the area. As shown in Table 4, there are also no significant differences between the occupational groups in responses to this statement. The item "The general crisis in welfare" (15.3%) similarly appears to be too abstract in its formulation, and this statement does not show any significant difference between the occupational groups (see Table 4).

The items asking how to deal with problems that show the highest number of negative responses (apart from the one

TABLE 3 Distribution (%) of "I do not know" responses per statement.

| What is the reason for the teacher shortage? Teacher shortages are due to … | |
|---|---|
| … changing and deteriorating conditions for teachers | 1.3 |
| … deteriorating status | 3.1 |
| … an increase in the number of pupils | 3.1 |
| … the risk of teachers being exposed to violence (mental or physical) or abuse | 5.3 |
| … the requirements of the teacher's certificate | 6.7 |
| … curriculum reforms | 8 |
| … dropouts from teacher education programs and from the profession | 8 |
| … policy reforms at the structural level (e.g., municipalization) | 9.1 |
| … the negative media debate | 9.1 |
| … teacher training reforms | 10.2 |
| … the deprofessionalization of the profession | 11.8 |
| … the view of knowledge that permeates the curriculum | 12.9 |
| … an imbalance between men and women | 14.9 |
| … the general crisis in welfare | 15.3 |
| … different governance philosophies | 17 |
| … other reasons for the shortage of teachers | 75.4 |
| **How to address the teacher shortage** | |
| Higher wages | 0.7 |
| Raise the status of the teaching profession | 0.9 |
| Better opportunities for professional development in the profession | 2.4 |
| Focus on facilitating students' ability to absorb learning during the school day | 6.4 |
| A different media debate on the teaching profession | 7.6 |
| Another form of governance (the state as school authority) | 9.8 |
| Intensive or short-term teacher training | 10.4 |
| Improve teacher training | 11.1 |
| More independent schools | 11.3 |
| Faster and better validation of knowledge/skills | 12.4 |
| Fewer independent schools | 15.1 |
| More training places | 18.7 |
| Other things | 77.1 |

previously commented on) are "More training places are needed" (18.7%) and "Fewer independent schools are needed" (15.1%). Both statements are of a structural nature (i.e., they are not within the decision-making area of a school or a professional category). Most of the statements in this question area that received about 10% "I do not know" responses have this structural character. One interpretation of the slightly more frequent" I do not know" responses for these statements is that for some respondents, it was perceived to be too far from their everyday pedagogical life. Overall, however, we believe that relatively few responses were answered this way, which reinforces the validity of the questionnaire to answer the knowledge questions in the article.

As commented earlier, the questions in the survey were divided into three areas: (a) the reason for the teacher shortage, (b) how to solve the teacher shortage, and (c) time perspective in solving the shortage. The first two questions were addressed in the previous text. In the following text, the empirical material is presented and discussed in relation to Question 3—are there statistically significant differences and similarities between the respondent groups' answers regarding causes and solutions for the teacher shortage and, if so, in what respects?

Ten of the 16 items concerning the causes of teacher shortages show significant differences in responses between groups of respondents. A clear recurring pattern (seven out of 10 items) is that student health staff show deviating response patterns in relation to other school staff (principals, teachers, other staff; see Table 4). The differences in responses include that the student health personnel marked higher agreement with some statements and lower agreement with others in relation to other school staff. In terms of content, student health care staff show distinctive perceptions in relation to the other groups on curriculum reforms, conditions for teachers, dropouts from the teaching profession, number of pupils, and view of knowledge. For the statement on the importance of the negative media debate, head teachers have a significantly different opinion than teaching staff in the schools, and for the question of whether teacher shortages are due to changed and deteriorating conditions for teachers, teachers show a higher level of agreement with the statement than head teachers. For the statements on deprofessionalization of the profession and the risk of violence, responses differ significantly between teachers and higher education staff.

Another difference that emerges is the significance of a teacher's certificate in the teacher shortage—untrained teachers evaluated this issue differently than trained teachers, student health personnel, and teachers at universities. Another difference is that trained teachers evaluated the issue of political reforms at the structural level and the curriculum's view of knowledge differently compared to other staff.

We discussed the variation in responses between occupational groups to statements about the causes of teacher shortages previously. Similarly, Table 5 shows the variation between occupational groups regarding options for solving the shortage. The empirical material presented in Table 5 shows that eight of 13 statements show significant differences in responses between groups regarding solutions to the teacher shortage. One pattern is that trained teachers often show significant differences in responses regarding solutions to the teacher shortage in relation to other professional groups. This applies to the statements about different governance (the state), a different media debate, fewer independent schools, no shorter teacher training, and no faster validation of skills, among other aspects. Another pattern is that principals have different opinions on the issue of the media debate compared to trained teachers, student teachers, and staff in higher education institutions. Additionally, untrained and other staff

TABLE 4 Statements with significant differences between occupational groups in reasons for the teacher shortage.

| Items with significant differences between groups of respondents regarding reasons for teacher shortages | Asymptotic sign. | Adjusted sign. |
|---|---|---|
| *Policy reforms at the structural level (e.g., municipalization)* | 0.007 | |
| Trained teachers vs. student health worker | | 0.024 |
| Qualified teachers vs. other staff | | 0.000 |
| *Different governance philosophies* | 0.482 | |
| The teacher shortage is due to curriculum reforms | 0.005 | |
| Student health workers vs. trained teachers | | 0.001 |
| Student health staff vs. other staff | | 0.001 |
| Student health staff vs. principals | | 0.001 |
| Student health staff vs. teaching staff | | 0.043 |
| Student health workers vs. trained teachers | | −0.023 |
| *Teacher training reforms* | 0.033 | |
| *Requirement for a teaching certificate* | 0.000 | |
| Untrained teachers vs. teachers (trained) | | 0.000 |
| Untrained teachers vs. student health workers | | 0.035 |
| *Changing and deteriorating conditions for teachers* | 0.000 | |
| Trained teachers vs. principal | | 0.048 |
| Trained teachers vs. student health workers | | −0.027 |
| *Dropouts from teacher training and from the profession* | 0.003 | |
| Trained teachers vs. student health workers | | 0.048 |
| Student health staff vs. principals | | −0.17 |
| *Deteriorating status* | 0.276 | |
| *Increase in the number of pupils* | 0.000 | |
| Trained teachers vs. student health workers | | 0.002 |
| Untrained teachers vs. student health workers | | 0.017 |
| Other staff vs. student health staff | | 0.024 |
| *De-professionalization of the profession* | 0.015 | |
| *Imbalance between men and women* | 0.57 | |
| *The general crisis in welfare* | 0.087 | |
| *The negative media debate* | 0.001 | |
| Principal vs. trained teachers | | 0.014 |
| Principal vs. untrained teachers | | 0.004 |
| Teacher shortages are due to the risk of teachers being exposed to violence (mental or physical) or abuse | 0.006 | |
| Trained teachers vs. higher education teaching staff | | 0.004 |
| *The view of knowledge that permeates the curriculum* | 0.000 | |
| Student health workers vs. trained teachers | | 0.028 |
| Student health staff vs. principals | | 0.049 |
| Qualified teachers vs. other staff | | −0.034 |
| *Other reasons for the shortage of teachers* | 0.497 | |

have different views than the other groups on the question of whether intensive or shorter teacher training is needed. Untrained teachers believe to a greater extent than the other groups that the solution lies in intensive or shorter training, or that faster and better validation of knowledge/competence is needed. To summarize evaluations of solutions to the teacher shortage, there is no uniformity between the professional groups in their responses.

TABLE 5 Statements with significant differences between occupational groups on how to solve the teacher shortage.

| Statements with significant differences between the groups of respondents regarding solving the teacher shortage | Asymptotic sign. | Adjusted sign. |
|---|---|---|
| *Higher wages are needed* | 0.152 | |
| Another form of governance (the state) | 0.000 | 0.003 |
| Qualified teachers vs. other staff | | 0.006 |
| Qualified teachers vs. principals | | 0.000 |
| Qualified teachers vs. student teachers | | −0.000 |
| Principals vs. qualified teachers | | −0.001 |
| Higher education teaching staff vs. qualified teachers | | |
| *Better opportunities for professional development* | 0.027 | |
| There is a need to improve teacher training. | 0.007 | |
| Principals vs. student teachers | | 0.006 |
| University teaching staff vs. principals | | −0.02 |
| Student teachers vs. principals | | −0.006 |
| *A different media debate* | 0.011 | |
| Principals vs. trained teachers | | 0.020 |
| Rectors vs. teaching staff in universities | | 0.013 |
| Principals vs. student teachers | | 0.005 |
| *Focus on facilitating students' ability to absorb learning during the school day* | 0.303 | |
| *More independent schools* | 0.000 | |
| Qualified teachers vs. other staff | | −0.045 |
| Qualified teachers vs. student teachers | | −0.00 |
| Student health staff vs. other staff | | −0.000 |
| Principal vs. other staff | | −0.009 |
| University teaching staff vs. principals | | −0.001 |
| *Fewer independent schools* | 0.000 | |
| Qualified teachers vs. principals | | 0.037 |
| Trained teachers vs. teaching staff in higher education | | 0.003 |
| Student health workers vs. trained teachers | | −0.014 |
| *Raise the status of the teaching profession* | 0.233 | |
| *More training places to become teachers* | 0.046 | |
| *Other staff vs student health staff* | | −0.017 |
| *Intensive or short-term teacher training* | 0.000 | |
| Untrained teachers vs. trained teachers | | |
| Untrained teachers vs. student health workers | | 0.000 |
| Untrained teachers vs. teaching staff at university | | 0.000 |
| Other staff vs. trained teachers | | 0.002 |
| Other staff vs. student health staff | | 0.000 |
| Other staff vs. teaching staff in higher education | | 0.000 |
| *Faster and better validation of knowledge/skills* | 0.000 | |
| Untrained teachers vs. trained teachers | | 0.048 |
| Untrained teachers vs. student health workers | | 0.001 |
| Untrained teachers vs. teaching staff at university | | 0.023 |
| Student health staff vs. principals | | −0.004 |
| Student health staff vs. principals | | −0.001 |
| *Other things* | 0.463 | |

## 6 Discussion

Tables 2, 3 show that the statements of the questionnaire were validated as relevant by the professional groups in terms of causes of teacher shortages and what can be done. Furthermore, the review of the empirical material presented in Table 4 showed a fairly large similarity in perceptions between the professional groups, with some exceptions. A very clear difference can be found in the evaluation of possible causes of the teacher shortage between student health personnel (medical personnel, behavioral scientists, school psychologists) and others working in schools. One possible explanation is related to professional activities. Student health workers are not involved in the daily pedagogical activities of a school, and they have different professional educational backgrounds than teachers, as well as a different and more limited focus on student groups and the work of the school. This differs from the other stakeholder constellations studied and may indicate the reasons this group evaluated the causes of teacher shortages differently compared to the others. The same clear difference between student health staff and the other stakeholder groups studied does not recur in terms of possible solutions to the teacher shortage.

In addition to those described, the analysis of other differences between professional groups can be facilitated by categorizing the statements into different dimensions of school activities. These include structural, social, and cognitive influencing factors of importance (cf. Blanco et al., 2023).

The structural dimensions of teacher shortages can be described as relating to the nationally set conditions for school activities (i.e., influencing factors outside the control of professionals). The causes of teacher shortages include political reforms, governance philosophies, the general crisis in welfare, teacher education reforms, curriculum reforms, and teacher licensing requirements (cf. Boström et al., 2021). Perceptions of possible solutions include higher salaries, better opportunities for professional development, different governance, improved teacher training, more or fewer independent schools, more training places for teachers, and more intensive or shorter teacher training (Håkansson Lindqvist et al., 2022).

The social dimensions of teacher shortages can be described as relating to the conditions of the organization of school work. The causes of teacher shortages include changing and deteriorating conditions for teachers, declining status, increasing numbers of pupils, and imbalance between male and female teachers (Boström, 2023). Perceptions of possible solutions include higher status as well as faster and better validation of knowledge.

The cognitive dimensions of teacher shortages can be described as relating to the relevant actors' individual perspectives on work in schools or teaching. The causes of teacher shortages include the deprofessionalization of the profession, dropouts from teacher training or the profession, the negative media debate, perceptions of the risk of violence or abuse, and perceptions of the view of knowledge that permeates the curriculum. Perceptions of possible solutions include the need for a different media debate on the teaching profession and a focus on facilitating student learning (Kungl. Ingenjörsvetenskapsakademien, 2020). It is important to emphasize that these three dimensions are not mutually exclusive. In some cases, the statements categorized under each dimension also contain elements that can be placed in one of the other dimensions. Therefore, the categorization into dimensions was only done to clarify possible differences between the stakeholder groups, but it needs to be evaluated and analyzed in more detail in further research.

In addition to the overall discussion regarding student health staff, the statements categorized under the structural dimension show a certain difference in perspective between trained and untrained teachers regarding the causes of the teacher shortage. There is also a (not unexpected) difference in evaluation between trained teachers and principals regarding one of the statements in the social dimension—deteriorating conditions for teachers. With regard to the cognitive dimension, the principals' stronger emphasis on the negative media debate compared to trained and untrained teachers is particularly noteworthy. The negative media debate on schools is also perceived to have a direct impact on principals' abilities to recruit teachers.

The clear differences between student health staff and other stakeholder groups regarding the causes of the teacher shortage are not present in the evaluations of possible solutions. With regard to this area, there is an overall greater variation in responses between the groups. The greatest variation in the area of possible solutions to the teacher shortage is in the responses to the statements included in the structural dimension. For example, several of the statements in this dimension show a difference between trained teachers and other school staff (cf. Lindqvist, 2020). Not unexpectedly, untrained staff emphasize shorter training to become a teacher. Regarding the social dimension, there is, also not unexpectedly, a difference between untrained teachers and other school staff regarding the need for faster and better validation of knowledge/competence. Additionally, in relation to this statement, a statistically significant difference exists in responses between head teachers and student health staff. This difference highlights the earlier comment about differences in educational background and tasks in the school. This result is worrying, given the potential for successful preventive and health-promoting student health work via student health teams consisting of educators, student health staff, and management staff. Regarding the cognitive dimension, there are differences in responses between head teachers and several other stakeholder groups regarding the media debate on the teaching profession. It is noteworthy that students do not appear in Table 4, but they do in several of the statements in Table 5. The explanation is probably that students do not feel confident about the causes of the current situation, but they may have ideas about what can be done in the future.

The article's theory presentation involves three theoretical approaches relevant to the study of teacher shortages. Representations (Bacchi, 2009) of the problem are important in describing similarities or differences between professional groups' perceptions of the causes of teacher shortages. The importance of analyzing the representations of the problem can be linked to the complexity of the problem area described via the wicked problem theory (Rittel and Webber, 1973). Regarding the perception of solutions, and considering that the teacher shortage can be understood and analyzed as a wicked problem, we believe that coordination becomes an important concept in the sense of whether the conditions for coordination of possible decision-making on solutions (Lindblom, 1965) exist, or whether the values of the relevant groups of actors differ so much that efforts need to be made for a more uniform problem description and a common action plan. Opportunities for coordinated action on the societal problem of teacher shortages can be significant in terms of possible solutions, and why little or nothing has been done, despite long-term knowledge of the problem area (cf. Berglund and Bostedt, 2023). In the introduction and background sections of this article, we discussed the fact

that wicked theory has previously been used to analyze teacher shortages. The empirical evidence presented in this study confirms the usefulness of the theory. In questions about the causes of the problem and its possible solutions, the multiactor approach of this study shows variation in representations of the problem and regarding possible solutions. This variation in views on which solutions are preferable/most important provides a basis for the need for further analysis and public discussion of teacher shortages, as well as concern about the possibilities of coordinated efforts. Coordinated interventions based on policy decisions by authoritative decision-makers with accompanying program initiatives must also be accepted and implemented by relevant school actors.

While this study shows a variety of perceptions of possible solutions, it is worth noting that initiatives to address the teacher shortage have been launched. In particular, four new phenomena to solve the acute teacher shortage can be mentioned. One is temporary teachers, the extent of which is predicted to increase and the outcome of which is controversial in terms of cost-effectiveness and the contribution to pedagogical development (Axelsson, 2021). The second is full-time mentors (Gardsten and Fonsceca, 2019) hired to address teacher shortages, who have been shown to facilitate teachers' everyday work. The third, closely related to mentors, is teacher assistants, whose number has increased significantly in recent years. They give teachers relief from their duties, but at the cost of reducing teachers' contact with pupils and guardians (Lindqvist, 2020). The fourth is the current government proposal for a professional program for teachers and principals (Regeringskansliet, 2021).

Three of the four initiatives listed are not included in the stakeholder groups' suggestions for solutions, emphasizing the need for coordinated policy efforts in this area. However, it also shows that new actors and new possible solutions to the teacher shortage are emerging. It remains to be seen whether the implementation of the proposed solutions facilitates or further complicates the teacher shortage. It is possible that some of the proposals may make it easier for teachers to remain teachers (cf. Lindqvist, 2020).

## Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

## Author contributions

LB: Conceptualization, Funding acquisition, Methodology, Writing – original draft, Writing – review & editing. GB: Conceptualization, Formal analysis, Writing – review & editing.

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## Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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## Publisher's note



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