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Volume 3:
Organisation and Leadership

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Abbas Strømmen-Bakhtiar
This book is dedicated with all my heart to my grand children with love Caleb, George, and Agusta

Roger Helde
I dedicate this book to my three lovely daughters Solveig, Ina and Ingrid

Elisabeth Suzen
I dedicate this book to my children, Sara and David, whom I learn from every day

Preface

This is the third book in our trilogy that explains different aspects of Supplemental Instruction (SI). Our first book dealt with SI and technology, while our second book looked at student learning processes and SI. This book, the third in our trilogy, examines different aspects of SI in organisations and leadership.

Chapter one begins by examining the experiences of SI at two Scandinavian universities. The purpose of this study was to explore the similarities and differences in implementing SI in these schools. Among the questions raised were, what were the reasons and background for implementing SI? How was the SI programme funded, prioritised, and made visible and more widespread? What type of research and results relating to SI have been put forward? What have been the challenges and success factors during the implementation and integration of the SI programme? This chapter examines each question and provides us with answers.

Chapter two discusses the dropout problem in institutions of higher education (HEIs). To address this issue, many HEIs have implemented SI, implying that groups of students meet regularly during the semester under the guidance of an experienced student leader. Considering the widespread implementation of SI, it is important to understand: 1) how SI sessions should be organised, 2) the characteristics of successful SI leaders, and 3) the degree to which SI improves retention rates and exam results. The authors examine each issue and present their findings.

Chapter three deals with SI and learning leadership and leadership development. The authors investigate the following question: what are SI leaders' understanding and experience of the SI programme's contribution to learning about leadership and leadership development? This issue is examined further by posing the following three questions: how have SI leaders learnt leadership in the SI programme? How have SI leaders understood their role? How have SI leaders understood and experienced that the SI programme contributes to leadership development? In this chapter, these questions are examined in detail and answers are provided.

Chapter four deals with the role and benefits of being a member of an SI team and employability. This topic has received little attention, hence this study offers much to the literature.

Chapter five focuses on SI implementation in healthcare education. Within pharmacy or nursing education, the literature on the implementation and evaluation of SI is limited. The objective of this study was to describe the experiences of an SI pilot in two first-year courses in pharmacy and nursing education and to evaluate the impact of the SI model on SI leaders and students.

Chapter six discusses technology and education, something that we dealt with in our first volume. However, we include this article as a brief change of scenery, from the physical classroom to the online one. This chapter analyses the virtual students' attitudes towards SI online. The chapter begins by outlining the similarities between

so-called high-risk courses and distance-learning courses. It then discusses students' attitudes towards SI in an online setting based on the results of a survey of language students. The chapter concludes with suggestions on how to adapt SI for an online environment, considering the possibilities and restrictions imposed by virtual meetings.

Chapter seven concludes this volume by exploring the Supplemental Instruction programmes in Europe. SI has been utilized for 47 years and was first developed and used in the United States. It was adopted in Europe in the early 1990s at Kingston University in the UK and has since spread to numerous other HEIs in the region. However, little has been published about SI in Europe besides some research papers addressing the impact of the method at specific HEIs. Thus, an overview of the SI programmes in Europe is of interest, addressing the number of HEIs that use SI as well as information on programme sizes, goals, outcomes, etc. The present study provides such an overview and presents results based on surveys sent to all supervisors in Europe who are trained in the methodology. The results from the study have been published in their entirety in a report (Malm et al., 2018). The idea is to continuously revise the contents of the report to include new programmes, exclude terminated ones, and make updates to existing ones.

We thank the Nord University, especially the Business school (Norway), and Lund University (Sweden) for their financial contribution to this project. Special thanks are also extended to Professor Terje Andreas Mathisen, the Vice Dean for research and others at Nord University's Business School for their support and encouragement.

This concludes our preface. We hope that you enjoy this book as much as we have.

Abbas Strømmen-Bakhtiar, Roger Helde, Elisabeth Suzen

Table of Contents

1 Experiences of Supplemental Instruction at Two Scandinavian Universities

Roger Helde, Elisabeth Suzen & Joakim Malm

Abstract: This article examines experiences regarding Supplemental Instruction (SI) at two Scandinavian Universities. The purpose of the study is to describe the basis for and implementation of SI programmes at the two schools, and to compare their similarities and differences. Our research questions are as follows: what were the reasons and background for implementing SI? How was the SI programme founded, prioritised, and made visible and more widespread? What type of research and results relating to SI have been put forward? What challenges and success factors have been experienced during the implementation and integration of the SI programme? The study employs a qualitative design, aiming to provide in-depth information about the universities' implementation and organisation of SI programmes. A case study approach allows us to study the SI programmes as a process and activity, since case studies provide the opportunity to explore or describe a phenomenon in context. To describe the cases, we selected a set of factors to focus on, including: reasons for introducing and implementing SI, prime advocates, integration and communication, research on SI, and successes and challenges. Our results show that the two universities give the same reasons for introducing SI, but differ in their organisation and integration of the SI programme.

1. Introduction

Supplemental Instruction (SI) is currently used in around a thousand higher education institutes (HEIs) worldwide (Power, 2010). It is likely that these HEIs have different reasons for and experiences with implementing SI, yet they all provide opportunities for learning from those experiences. In this chapter, we present a study of the SI programme at two universities, Lund University in Sweden and Nord University in Norway. The purpose is to describe the basis for and implementation of SI programmes at the two schools, and to compare their similarities and differences. A case study approach allows us to study the SI programmes as a process and activity, since case studies provide the opportunity to explore or describe a phenomenon in context (Baxter & Jack, 2008). Stake (2005) claims that choosing the case that offers an opportunity to learn may also mean selecting the most accessible one, or the one on which we can spend the most time. For that reason, we have chosen Lund and Nord Universities as cases in this study. Both universities have had SI programmes for long enough to have gained substantial experience of them. In the research, we have focused on the background and reasoning for introducing SI at the universities, the organisation and life of the SI programmes, success factors and challenges, and research conducted on SI at the campuses.

What factors are important to the successful implementation and execution of an educational programme? Previous studies of the implementation of measures in higher education show that the internal organisation of the institution plays a key role in this respect (Garrison & Kanuka, 2004; Stensaker, Maassen, Borgan, Oftebro, & Karseth, 2007). The measures must have the support of both the management and those who are going to carry them out in practice. This necessitates a common understanding between management and staff in terms of their expectations of the measure being clarified and harmonised. Without active management support, the measures are more often sporadic and random, regardless of how good the plan or intention. Training in, and the structure and content of, the programme are also significant, as well as how the measure is integrated in the institution as a whole (Nordahl, Gravrok, Knudsmoen, Larsen, & Rörnes, 2006).

There are a number of key factors that can be crucial to the implementation and life of an SI programme at a higher education institution. However, previous studies have shown that it is not the administrative placement of an SI programme that is crucial, and it is recommended that researchers 'investigate other campus cultural factors that might have a more influential role in supporting the success of academic enrichment programmes like SI than just focusing on the narrow variable of administrative placement' (Arendale, 2001, p. 254). Our study shows what these key factors may be, how they may be applied in practice, and how they can affect the implementation of an SI programme. We have not looked at the content of the SI programmes as such, but rather their implementation and organisation at two universities.

2. Method and Data Collection

This study employs a qualitative design, aiming to provide in-depth information about the universities' implementation and organisation of SI programmes. The cases were chosen because we believe that understanding them will lead to better comprehension of an even larger collection of cases. In an instrumental multiple-case study, it is not the case that is dominant, but the issue (Stake, 2005). This requires two or three focused research questions that help to structure the data collection (Stake, 1995). Our research questions are as follows:

- What were the reasons and background for implementing SI?
- How was the SI programme founded, prioritised, and made visible and more widespread?
- What type of research and results relating to SI have been put forward?
- What challenges and success factors have been experienced during the implementation and integration of the SI programme?

2.1 Data collection

To describe the cases, we selected a set of factors to focus on, including: reasons for introducing and implementing SI, prime advocates, integration and communication, research on SI, and successes and challenges. Multiple sources were selected to capture the complexity of the cases. Data were collected through interviews, personal correspondence, (strategic) documents, course descriptions, research, websites, and other media. The researchers also collected information about the historical development through personal (written and verbal) communication with the staff responsible for the SI programme when it was introduced at the universities – Leif Bryngfors at Lund University and Bård Toldnes at Nord University. These employees still work at their respective schools and are involved in the SI programmes to varying degrees. In line with Stake's (1995) approach, a considerable proportion of all data were gathered informally as we first became acquainted with the case. Semi-structured interviews were conducted with the persons running the SI programmes at the two universities. We also emphasised an approach whereby we consolidated, reduced, and interpreted the interviews and document resources to make meaning of both what was said and written, and how we saw and read it. This process of making meaning is the process of analysing data (Merriam, 1998).

All three authors are employed at the two universities included in the study. This causes a consciousness regarding our role as researchers, which is a technique used to ensure reliability (Merriam, 1998):

> When it becomes important to study one's own organisation or workplace, I typically recommend that multiple strategies of validation be used to ensure that the account is accurate and insightful. (Cresswell, 2007, p. 122)

Although qualitative research does not include a validation process because validation is from an opposing epistemology, Merriam (1998) presents some strategies used to enhance internal validity. We have applied three of them: member checks, participatory research, and triangulation. We also emphasised thorough descriptions to ensure the quality of our work.

In our study we have chosen to describe the historical contexts first, including the reasons for implementing SI at the two case universities. Thereafter, we look into the SI programmes in practice, and we conclude by looking at the research conducted on SI at the universities as well as success factors and challenges.

3. Case 1, Lund University

3.1 A History of SI at Lund University

A delegation from Lund University came across SI during a study trip in the United States in the early 1990s. Inspired by the information about the peer learning programme, two colleagues from academic support attended a supervisor training at the

University of Missouri Kansas City (UMKC) where the SI system had been developed. Thereafter, a pilot programme was established in 1994 in the Faculty of Engineering and the Faculty of Science at Lund University. The initial results were promising with respect to SI's impact on student results (Bruzell-Nilsson & Bryngfors, 1996; Bryngfors & Bruzell-Nilsson, 1997). However, at that time, student retention was not considered a priority. To maintain and develop the SI programme at Lund University, the two colleagues promoted the qualitative benefits of SI – to help new students to adapt to higher education and obtain appropriate learning strategies (Leif Bryngfors, initiator of SI at Lund University, personal communication, 3 April 2020). This approach was well received by the faculty management and laid the foundation for a permanent SI programme at the two universities.

Since then, SI has grown continuously at Lund University. In 2001, SI was introduced at the Faculty of Humanities and Theology with the objective of increasing the number of students who passed the introductory courses and continued on to advanced courses. The Faculty of Social Sciences introduced SI in 2007 with the objective of helping new students with the transition to higher education. In 2013, SI was reintroduced at the Faculty of Science (after a few years' absence) on the initiative of the vice dean. The vice dean had several reasons for this, with providing academic support for new students and improved student performance and learning in introductory courses being the main ones (Bo Anders Jönsson, former Vice Dean of the Faculty of Science at Lund University, personal communication, 20 March 2013). In 2014, a central initiative was introduced by the management at Lund University, led by the vice dean of science, to spread information about SI internally and to train SI supervisors in new subject areas. This resulted in SI being introduced as a supplement to numerous new courses. SI programmes were started at the School of Economics and Management, on the initiative of the student advisers for Business Administration and Law, and the Faculty of Medicine through the combined efforts of students and teachers in the nursing programme. The main objectives for these new SI programmes were, as above, to improve student learning and performance and to provide the students with better learning strategies. An evaluation report of SI at Lund University during the academic year 2016/2017 (Malm et al., 2017) showed that SI had become an extensive peer learning programme:

- ~230 SI leaders were employed each year,
- ~70 courses were supported by SI,
- more than 4,000 students participated in SI each year, and
- average SI attendance was about 30%, and the number of students per SI session was, on average, 10.

Besides implementing SI in higher education, Lund University has been a pioneer in linking secondary and higher education using SI. This started as a pilot at the Faculty of Engineering in 2007, where university students were sent to six upper-secondary schools in the region to hold SI sessions in maths, physics, and chemistry. The main

ideas behind the initiative were recruitment (to reach new student groups) and to establish links between upper-secondary schools and the university. The SI initiative in secondary schools expanded considerably through a regional SI platform in 2016, with an overarching goal of securing the competence provision in the southern region of Sweden. Today, five HEIs, with Lund University as a major hub, cooperate with secondary schools in the majority of municipalities in the regions of Skåne, Blekinge, and Halland (Fredriksson, Bryngfors, & Mörner, 2018). The idea is to provide links through SI all the way to elementary school by having older pupils serve as SI Leaders for younger pupils.

Lund University was the first HEI in Scandinavia to introduce SI in higher education. In 2001, it also became the National Centre for SI in Sweden and the surrounding countries. This meant that a certified trainer from Lund could train staff at other universities in Sweden, Norway, and Denmark to become SI supervisors and start their own SI programmes. This has led to a rather extensive expansion of HEIs in Scandinavia over the last 20 years, primarily in Sweden. More than 300 staff members at over 30 HEIs have been trained as SI supervisors, as well as numerous teachers from secondary schools. In 2016, the Scandinavian SI centre merged with the UK PASS centre to form the European Centre for SI-PASS, located at Lund University. The European Centre, together with the former national centres, have trained almost 1,000 SI supervisors in 13 countries.

3.2 The SI Programme at Lund University

The SI programme at Lund University consists of several independent SI programmes. The interest in SI has started either at a course/subject level or at the faculty level. SI programmes have thereafter been implemented once the interested persons have been trained as supervisors. To better support the individual SI programmes, Lund University decided in 2015 to centralise these efforts under what, a year later, became the European Centre for SI-PASS (funded by the university). The tasks included providing information about SI to students and personnel, training supervisors and SI leaders, and completing evaluations and research on SI. An overview of SI at Lund University with the involved faculties and examples of supported courses is presented in Table 1.

Tab. 1: Overview of SI-supported courses of faculty at Lund University

Faculty	Year SI was initiated	Examples of SI-supported courses
Engineering	1994	Calculus, Mechanics, General Chemistry, Organic Chemistry, Digital Communication, Physics
Health Sciences	2014	Anatomy, Cell Biology, Pharmaceutical Calculation

Humanities & Theology	2001	Basic courses in History, Philosophy, Archaeology, Human Rights, Journalism, Art Science, Musical Science, Ethnology, Arabic, English, Japanese, Russian, Spanish, Linguistics, European Studies, Theology, and Religion Studies
School of Economics and Management	2014	Basic courses in Business Administration and Business Law
Science	1994/2013	Calculus, Algebra, General Chemistry, Electromagnetism, Cell Biology, Introduction to Geographical Information Systems: Minerals and Rocks
Social Sciences	2007	General Psychology, basic course in Sociology, Social Work as a Field of Study and Profession, Introduction to Service Management

It is described above how SI is organised at Lund University. The European Centre for SI-PASS is the central unit that supports SI programmes at the faculty, subject, and course levels. SI is documented in various ways at the university, aside from information material and evaluation reports from the European Centre, and is included in some of the faculties' action plans (see, for instance, the Action Plan for Science in 2020). SI is also evaluated in the Student Barometer, a survey used to evaluate the students' experiences at Lund University (Quality and Evaluation/Lund University, 2017). SI is also visible on several websites, including:

- European Centre for SI-PASS: https://www.si-pass.lu.se/
- Business Administration: https://www.fek.lu.se/utbildning/studieinformation/vad_ar_si
- Humanities & Theology: https://www.ht.lu.se/utbildning/nuvarande-student/mentorsverksamhet/.

SI is represented at the fair organised for new students at Lund University each semester (see Source, 2020). A special event and a ceremony are organised for SI leaders each year.

The European Centre for SI-PASS cooperates with regional SI centres in the US, Canada, South Africa, and Australia. It also has ties with over 70 HEIs in Europe as part of its work as the SI-PASS centre in the region, and it cooperates with the Academic Peer Learning network in Europe. Personnel from the European Centre for SI-PASS participate in various conferences to provide information about SI, including the annual European First Year Experience conference. It also organises the European Peer Learning Conference, the annual European SI Leader conference, and a national SI conference in Sweden each year. The centre also encourages SI leaders to take part in developing SI material, such as information videos (e.g. Lund University, 2017) and advertisement material (T-shirts, bags, hoodies, pens, brochures, etc.). The latest development is an English-language app for SI leaders ('SI Cards & Session Planner')

on learning strategies and session planning that can be downloaded via the App store and Google Play.

In a report from the Swedish Higher Education Authority (Bjernestedt & Lundh, 2019), which is responsible for evaluating educational development work in higher education, widening participation was seen as one of the two main challenges in Swedish HEIs. Widening participation is about creating inclusive academic environments where education is student centred and requires active learning. Lund University has recognised SI as a major tool in this work (Virkelyst, 2019). SI is used, for instance, to create links with upper-secondary schools where the pupils' families may not have an academic tradition. In doing so, besides having an active learning opportunity in a challenging subject, pupils are able to ask their peers questions about what it is like to study at university. The questions and responses can cover areas such as education formats, what is expected of a student, examinations, and student social life, to name a few. This can serve to de-dramatize and inspire pupils to enrol in higher education. SI at universities serves to create a structured but relaxed study environment where all types of questions are welcomed, as are all kinds of students. The goals of SI, besides providing help in challenging courses, are to create a sense of academic belonging, be a bridge between secondary and higher education, and to see one's peers as learning resources.

3.3 Research on SI Programmes at Lund University

Lund University has been active when it comes to evaluating and researching its SI programmes. The research has been quantitative and qualitative in nature, and has addressed issues such as student performance and retention, SI participants' views on SI, and benefits for SI leaders from their work. The research has been carried out as a part of evaluating the programme – a cornerstone of the SI methodology. The European Centre for SI-PASS, situated in Lund, has the responsibility for overall evaluation and research on SI at Lund University. Thus, the people involved in the research are mainly members of the European Centre. The subjects and areas of the research have been on:

- student performance and retention (Malm, Bryngfors, & Mörner, 2011a; Malm, Bryngfors, & Mörner, 2016; Malm et al., 2017);
- the SI programme (Bryngfors & Bruzell-Nilsson, 1997; Malm, Bryngfors, & Mörner, 2010; Malm, Bryngfors, & Mörner, 2011b; Malm, Bryngfors, & Mörner, 2015; Malm et al., 2018);
- the long-term effects of SI-PASS (Malm, Bryngfors, & Mörner, 2012; Malm, Bryngfors, & Mörner, 2015; Malm, Bryngfors, & Fredriksson, 2018);
- the impact of SI-PASS on leaders (Malm, Mörner, & Bryngfors, 2012); and
- other studies on SI (Malm, Mörner, Bryngfors, Edman, & Gustafsson, 2012; Fredriksson & Lindberg, 2014; Fredriksson, Bryngfors, & Mörner, 2018; Fredriksson, Malm, Holmer, & Ouattara, In press).

A summary of some of the research results is given below. One of the main topics has been to investigate how SI attendance impacts student performance. This is one of the well-covered areas in the international literature, but usually considers attendance to be a binary variable: either you attend SI or you do not. The cut-off in terms of the number of sessions you have to participate in to be considered an SI attendee is commonly chosen arbitrarily, usually in the range of 1–5. Lund University is one of the pioneers in comparing the degree of SI attendance to student performance. One example illustrating the effect of SI on student performance is given in Table 2. This way of quantifying the effect of SI appears increasingly to have become the standard in recent journal publications.

Tab. 2: Example of SI attendance vs. course results (percentage with passing grade) from four courses (after Malm et al. 2017)

Course	SI attendance			
	None	Low	Average	High
History	39%	44%	62%	76%
Calculus	23%	24%	43%	60%
Anatomy	25%	30%	38%	53%
Organic Chemistry	26%	42%	58%	74%

Table 2 does not, however, provide evidence that SI makes a difference, but rather an indication of this. The reason for this is that attending SI is voluntary and the students self-select into the programme. This means that students attending SI may have different characteristics compared to non-attendees that may explain, at least partly, the differences seen in the table. Several studies have been conducted at Lund University to establish whether there are differences between SI attendees and non-attendees with respect to factors like ability, motivation, gender, study strategies, study time, etc. These investigations mostly show that the differences are negligible, and when they are significant (e.g. females tend to attend SI to a slightly higher degree than males do), they do not explain the observed differences in student performance between SI attendees and non-attendees. A commonly raised argument for SI attendees' better performance is that it is mainly the 'strong' students who attend SI. But is that so? One way of checking this is by comparing prior academic performance between SI attendees and non-attendees. One such comparison has been made (Malm, Bryngfors, & Mörner, 2011b); see Table 3. Here, it is seen that, on average, all students, independent of prior academic achievement, appear to perform better in the course after attending SI. The more SI you attend, the better you do. This also indicates that having a heterogeneous group of students seems to benefit everyone.

Tab. 3: Percentage of students with a passing grade from a calculus course vs. SI attendance and prior academic achievement (upper-secondary school grade in mathematics). Students are divided into 'weak', 'average', and 'strong' students with respect to their grade. The results from 643 students are included in the table, distributed fairly evenly between the groups (after Malm, Bryngfors, & Mörner, 2011b).

SI attendance	Prior achievement–upper secondary school maths		
	'Weak'	'Average'	'Strong'
None	19%	38%	62%
Low	23%	51%	74%
Average	35%	68%	87%
High	56%	80%	94%

Other study programmes at Lund University have focused on the potential 'spillover' effects of SI to later courses due to students learning better study strategies and obtaining academic confidence. Malm, Bryngfors, and Mörner (2012, 215) showed that students attending SI in an introductory course had a better first-year experience in their studies with respect to credits taken over the year. A substantial part of the credit difference was obtained in courses without SI. Surveys have indicated that this effect of SI is due to the fact that SI participants improve their study strategies, skills in problem-solving, teamwork, critical thinking, presentation, and academic self-confidence. The long-term effects of attending SI during the first semester in a 5-year MSc engineering education programme were studied by Malm, Bryngfors, and Fredriksson (2018). They showed that timely graduation was considerably higher for students who had attended SI. A large part of this was due to higher dropout rates among students who did not attend SI or who attended SI sparingly.

Another question is how the student participants themselves perceive SI at Lund University. A survey carried out by Malm et al. (2017) shows a high level of satisfaction with the SI sessions among the attendees. The main reason for them participating appears to be to get a better understanding of the course material, while strategic reasons, such as getting a passing grade, are often secondary. The working environment in SI sessions is perceived to be good (easy to ask questions, informal, positive and supporting atmosphere, and a pace that is easy to adjust to), and the sessions follow the essential elements of an SI programme well. With respect to the SI-supported course, the majority appreciates the support that SI gives, the understanding achieved of what is expected of them, and that they obtain a deeper understanding of course material. A majority of the attendees also feel, at least partly, that their general skills, such as problem-solving, teamwork, presentations, and critical thinking, improve.

What about the SI leaders? What do they gain, besides the fact that it is a paid position? They generally value quite highly the experience of being SI leaders. They appreciate playing a role in helping students develop a better understanding of the material, as well as getting to know new people. They also value the skills they train

in and feel that they improve their facilitation and public speaking abilities as well as gaining confidence in leading groups of people. These are skills that, seen in hindsight, are something that will often benefit them in terms of both getting a good job and in the job itself (which often includes working in groups and on projects).

SI as a link between higher education and upper-secondary schools in southern Sweden has also been evaluated by Lund University (e.g. Fredriksson, Bryngfors, & Mörner, 2018; Malm, Mörner, Bryngfors, Edman, & Gustafsson, 2012). In general, both Lund University and the upper-secondary schools are satisfied with the cooperation, including pupil participants, leaders, supervisors, teachers, and principals. In particular, the attending pupils feel that their study strategies improve and that they obtain a better understanding of covered course material, as well as obtaining information about and inspiration to take studies at a higher level.

3.4 Challenges in Implementing and Integrating SI at Lund University

The main initial challenge in implementing SI at Lund University was to get people to understand what SI was. It required enthusiasts with entrepreneurial skills to reach out, explain, and obtain the interest of the university management, faculty management, departments, teachers, support personnel, and students. To get buy-in from these groups, it was very valuable to have obtained support from the university vice chancellor. Another plus was that the enthusiasts had received external funds for implementing SI. Thus, there was no initial monetary obligation for the faculties involved. Another minor initial challenge was to figure out which goals of SI would resonate with key people. Originally, in the US, it was much about saving money (i.e. improving student performance and retention). At that time, this was not much of an issue for the university and faculty management. However, qualitative aspects, such as helping students with the transition to higher education and improving learning experiences, were shown to be the reasons that created interest.

There were several challenges when integrating the SI programme at Lund University. SI was first implemented in mathematics at the Faculty of Science and Faculty of Engineering. This led to the perception that SI was some sort of mathematics support system and therefore not of interest in other courses/subjects. It required repeated and targeted information efforts by SI enthusiasts to personnel in other subject areas to change that perception. Another challenge was to acquire data from Lund University that showed the benefits of SI and to market them at the university. This required substantial efforts in collecting and analysing quantitative and qualitative data on SI. The results were then documented in reports and in articles in peer-reviewed journals (increasing the validity of the results for academics), and then disseminated through different channels (presentations for faculties and departments, internal educational conferences, workshops, websites, and university magazines and newsletters). A third challenge was to find the right people who could be SI advocates within their faculty or department to integrate the method there. Such people, who have both the time and personal characteristics required, are often quite hard to find. However, they are

necessary to establish the SI programme locally. A fourth challenge was to get funds for those coordinating SI centrally at the university. This is needed to ensure the longevity of the programme and provide support to local supervisors in terms of information, marketing, evaluation, and leader training. This was achieved 20 years after SI was introduced at Lund University as a result of the steady growth of SI to include more subject areas. A couple of contributing factors to obtain these central funds were that Lund University became the home of the European Centre for SI-PASS and that widening participation, which SI is well-suited to address, became a national priority in higher education. Seen in hindsight, the major success factors for SI at Lund University have been:

- The perseverance of the initial advocates of SI who have continued to market and provide information about the programme over the years.
- Patience in waiting for the right opportunities and people to integrate SI further into the university – leading to SI now being established in the majority of subject areas.
- Reports and journal publications based on evaluations and research on SI at the university to provide information about potential benefits and challenges of the programme.
- The establishment of the European Centre for SI-PASS at Lund University, which provided unique possibilities in networking and gathering information about SI (the objectives of the European Centre for SI-PASS are to provide information about the method, train new supervisors, and develop the method together with other regional SI centres worldwide).

Some things could also have been done differently and might have led to even better results. For instance:

- Having a more persistent and extensive promotion of SI within the university could have sped up the process of integrating SI. However, the lack of human resources and time made that impossible. It might also be the case that the slower growth has led to SI being more firmly established at the university with a more distributed buy-in from key groups.
- Involving student unions and teaching staff to a higher degree. This is probably the main action that could have been done better. It is quite likely that this would have achieved an even more firmly established SI programme, covering more courses and subjects, and with even better outcomes. This is something to strive for in the future.

4. Case 2, Nord University

4.1 A History of SI at Nord University

When Nord University was established in 2016, the SI programme was introduced at Nord University Business School in the Driving Instructor Education programme: it was adopted in the physics course in 2016 and in the law course in 2017. SI is included in the course descriptions for these subjects. The SI programme was introduced in Norway in 2004. This was in the physics course on the Driving Instructor Education programme at what was then Nord-Trøndelag University College (HINT), which later became part of the new Nord University in 2016. Since its establishment, Nord University has cooperated with Lund University on SI.

The background to the start-up in 2004 was that a member of staff at HINT was involved in the programme 'The First Year Experience' under the auspices of John Gardner and Betsy Barefoot from the University of South Carolina. Together, with the then rector of Trondheim College of Engineering, the two scholars visited a number of universities in the US that used 'University 101' (Bård Toldnes, personal e-mail communication, 9 April 2020). They came in contact with the SI group from Lund in this context. Bård Toldnes (who then worked at HINT) went to the University of Missouri, Kansas City, with a colleague, where they were trained in SI. The two colleagues worked on the engineering programme at HINT where they had developed 'The First Year Experience' as a programme at the university. This was later replaced by SI. The rector of HINT at the time contributed to the formalisation of SI at the college, which made it easier to train new SI supervisors later on. The reason for introducing SI at HINT was thus a desire to focus on first-year students to help them with the transition from upper-secondary school to university. This focus and understanding already existed at the university and could be replaced by SI. It was therefore expedient to choose SI programme courses in the first semester since the students can use SI to learn study techniques that they can benefit from in the rest of the programme. It also creates social arenas outside normal teaching activities. SI has been offered to first-year students in the Driving Instructor Education programme since 2016 (physics) and 2017 (law).

The SI programme at Nord University has attracted major media coverage and national interest in relatively few years. On 8 November 2018, the Communications Unit at Nord University published a news article on its website, 'Fra tretti til null prosent stryk' ('From a thirty to zero per cent fail rate' (https://www.nord.no/no/aktuelt/nyheter/Sider/Fra-tretti-til-null-prosent-stryk.aspx). The article gained the attention of the Norwegian University of Science and Technology's (NTNU) university newspaper, *Universitetsavisa*, which on Tuesday, 20 November, published an article, 'Strykprosenten falt fra 30 til 0 med ny studiemetode' ('Percentage of failing grades fall from 30 to 0 with new study method'; https://www.universitetsavisa.no/student/2018/11/20/Strykprosenten-falt-fra-30-til-0-med-ny-studiemetode-18364422.ece). The Norwegian Broadcasting Corporation (NRK) news followed up with a story on Thursday, 22 November (https://tv.nrk.no/serie/dagsrevyen-21/201811/NNFA21112218). On 24 November, an article about SI at Nord University was published in *Khrono*, an in-

dependent online newspaper for higher education and research in Norway. In the article, 'Nord universitet Stjørdal presser strykprosenten ned med "ny" metode' ('Nord University Stjørdal reduces the percentage of failing grades with "new" method'; https://khrono.no/nord-universitet-roger-helde-si-metodikk/nord-universitet-stjordal-presser-strykprosenten-ned-med-ny-metode/249955), the following was stated in the introduction (translated from Norwegian): 'Study technique. Meetings with students who previously earned good grades have done wonders for the percentage of failing grades in physics and law courses at Nord University Stjørdal.' Through this media coverage, SI at Nord University has attracted a great deal of national attention.

On the basis of the news articles, the university was contacted by many other Norwegian universities wanting to know more about the SI programme. On 2–4 April 2019, a course was therefore organised in cooperation with Lund University to train new SI supervisors at Nord University's Stjørdal campus. The course, led by instructors from Lund University and Manchester University, was aimed at teachers, educators, and academics at Norwegian universities and colleges. The 25 participants in the SI supervisor course were from various departments of Nord University, the University of South-Eastern Norway (USN), Stockholm University, and Oslo Cathedral School.

After the SI supervisor course in April 2019, new SI programmes were started at Nord University in the following faculties and programmes: the Driving Instructor Education programme (Stjørdal) at Nord University Business School, the Bachelor of Pharmacy (Namsos) and Bachelor of Nursing (Mo i Rana) programmes at the Faculty of Nursing and Health Sciences, and the Bachelor of Aquaculture Management and Bachelor of International Marketing programmes at the Faculty of Biosciences and Aquaculture (Bodø). In 2019, Nord University had about 50 SI leaders, four courses supported by SI, and 27 educated SI supervisors.

SI at Nord University is still in the implementation phase. There will be a new course for SI supervisors at the university in November 2020. The Vice Dean for Education at the university includes SI in meetings and presentations, and supports the work carried out on SI.

4.2 The SI Programme at Nord University

In 2019, certain challenges were identified at the Faculty of Nursing and Health Sciences related to the quality of education. For the bachelor's programmes, the completion rate within the nominal length of study varied between 55 and 65%, while there was a higher rate of dropouts from the master's programmes. The Faculty of Biosciences and Aquaculture wanted to provide a general SI leader training for all third-year students in the Bachelor of Aquaculture Management and Bachelor of International Marketing programmes (Bodø). The reason for this was that it was perceived as a beneficial experience for all students. The pilot SI leader course took place in autumn 2019. After the SI leader training, however, none of the new SI leaders wanted to work as SI leaders in practice.

As regards the Faculty of Nursing and Health Sciences, the implementation of SI was considered by the local education committee in a meeting on 14 May 2019. The dean then decided to immediately initiate a pilot project where SI was implemented as an educational model in two courses, one in the Bachelor of Nursing programme, Mo i Rana, and one in the Bachelor of Pharmacy in Namsos. Through this decision, the dean endorsed organising an SI leader course at the Faculty of Nursing and Health Sciences in cooperation with the Road Traffic Division at the Business School for the academic year 2019/2020. An evaluation of SI as a method is conducted by the faculty (Sletvold et al., 2021). The evaluation and goal attainment of the project are scheduled to be presented to the management in September 2020 (cf. decision by the dean, archive ref. 19/02000-1).

In connection with the SI programme being expanded to new subjects at the university, it was necessary for the organisation to learn from what had been done at the Stjørdal campus. The SI supervisor who had developed and was responsible for SI in the Road Traffic Division therefore took on the role of SI coordinator. The SI coordinator was assigned the overall responsibility for the SI programme at the university. The SI coordinator also established a national network for SI via the electronic platform Teams (including University of South-Eastern Norway and University of Agder), and managed the network, while also maintaining contact and collaboration with Lund University. This external collaboration helped to legitimate the SI coordinator role at Nord University. The management has given the SI coordinator its full support, but the role is not formalised in the organisation. The management is therefore entirely dependent on the engagement and enthusiasm of the SI coordinator in this role in order for the SI programme to develop new administrative structures and for new SI personnel to be trained. The absence of formalisation gives the SI coordinator a relatively high degree of freedom in the role. The cooperation between the SI coordinator and the management at the European Centre for SI-PASS at Lund University led to an SI supervisor course and SI research seminar being organised at Nord University in 2019. In addition to the SI coordinator, the SI supervisors are responsible for local SI programmes at the four campuses (Stjørdal, Namsos, Mo, and Bodø) where SI has been introduced.

The Vice Rector for Education at Nord University supports the work that has been done concerning the introduction of SI, and has invited the SI coordinator to internal and external management meetings at Nord University and Universities Norway (UHR),[1] to talk about the SI method and work on further developing the SI programme at Nord University and in Norway as a whole. SI was also raised in its consultation response on the matter of the mentor scheme at the university, and it was determined that the Business School wishes to continue its focus on SI as one of many measures targeting students and the faculty. Within the faculty, employees have been permitted to use internal R&D time to conduct research on SI. This interest and meeting activity

1 Universities Norway (UHR) is a cooperative body for 33 accredited universities and university colleges, cf. https://www.uhr.no/en/about-uhr/.

demonstrates that the interest in SI is integrated in the top management (cf. personal communication, email, 16 April 2020).

The lack of organisational formalisation and academic integration of the SI programme at the Business School means that both academic and organisational responsibility lie with the SI coordinator and SI supervisors (i.e. the teachers and researchers who are interested and believe in the SI method). As a consequence, the SI programme is managed from the bottom up, with the possibilities and challenges this entails. The SI programme's future and scope are determined entirely by the engagement and additional effort of researchers and teachers who at any time choose to become involved in SI work.

SI at the university is primarily documented through research work, internal evaluation reports (Helde, Supplemental Instruction, Nord universitet, Trafikkfag, Rapport om SI programmet ved Nord University, Road Traffic Division, October 2017 [in Norwegian]) and European evaluation reports (Malm et al., 2018). In 2017, the Business School prepared an information video about SI made by staff from the Road Traffic Division working with SI (registered in CRIStin, 2018). There is no central SI management that could function as a resource for the faculties, nor is SI visible on the university's website. SI is still not included in the faculties' action plans, nor evaluated in the Student Barometer, a survey used to evaluate the students' experiences at Nord University.

At Nord University, the focus on SI can be associated with the focus on student active learning. Having a student active learning focus is a national priority described in the 2017 NP Report, which is something that SI addresses. It is also emphasised in the Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG).[2] In recent years, Norwegian educational policy has pointed out that student active teaching methods and research have led to good results. At the same time, good research-based education requires systematic training in academic inquisitiveness, critical reflection, and independence throughout the students' studies, through discussion, feedback, testing, and assessment. The 2017 NP Report states that students taking higher education should be met as responsible participants in their own learning and experience stimulating and varied learning and assessment methods. The report refers to the fact that research-based education entails using research on what constitutes good learning to design teaching and learning activities, and that academic staff should test whether their teaching methods have the desired effect on

2 ESG was originally adopted at the ministerial meeting in Bergen in 2005 as part of the Bologna Process. The adopted revised version was drawn up by all the most important European organisations with an interest in and/or responsibility for quality assurance of higher education: the European University Association (EUA), the Association for Quality Assurance in Higher Education (ENQA), European Association of Institutions in Higher Education (EURASHE), and European Students' Union (ESU), in cooperation with Education International, Business Europe, and European Quality Assurance Register for Higher Education (EQAR).

the students' learning. However, student active learning methods and research are not used to any particular extent, and the culture for conducting research on teaching is limited.

4.3 Research on the SI Programme at Nord University

Nord University has a relatively short history of SI and there is therefore not much research related to SI at the university. The few research projects carried out have been quantitative and qualitative, and have addressed issues including SI leaders' experiences regarding SI (Helde & Suzen, 2019; Helde, 2021; Suzen, 2021), the SI programme (Hanssen, Fromreide, & Mathisen, 2020), students' performance (Sletvold et al., 2021), and other studies on SI.

The people involved in the research have been university employees with a role in the SI programme, but also employees from outside the programme. One of the main topics has been to investigate the role and experiences of the SI leaders. Research shows that SI leaders experience the SI programme as both an educational and leadership development programme, and they benefit in different ways from their participation (Helde & Suzen, 2019; Helde, 2021; Suzen, 2021).

4.4 Challenges with Implementing and Integrating SI at Nord University

The main challenge with implementing SI in Norway was that SI was unknown; only two colleagues at Nord University were involved in the initial phase. Thus, the first main tasks were to: 1) establish a robust SI programme, and 2) market and make SI known to students, staff and university administrators. It was important when establishing the SI programme to first find and train good SI leaders who could help market SI to the students. A film was made as a marketing initiative with contributions from SI leaders and participants. To sell the message internally, it was then important to collect evidence-based knowledge about the SI programme. An internal registration system was developed, which measured participation at SI sessions in relation to exam results. The results of SI participation were remarkable, and the internal communication department at the university wrote articles conveying the findings. Local newspapers, university newspapers and NRK news followed up and drew attention to SI in Norway. It was also important for the university to commence research work related to the SI programme to develop knowledge, document, and gain insight into the work. This has therefore been a priority since 2016.

The implementation of SI has become extremely dependent on individuals. A lack of integration in plans and strategy documents has led to the development of and research on SI being based on the extraordinary efforts of advocates and their belief in the programme. University administrators are expressly positive, but in the long term, there is a risk of the programme fading out if these enthusiasts become burnt-out. To avoid this, the SI programme could be incorporated into the university's research

and teaching plans, and the management roles could be enshrined in employment contracts and work plans.

However, the positive aspects of introducing SI to Nord University include the good results it has had for students, research and research dissemination, marketing in the media and at meetings, cooperation with Lund University, and the enthusiasm it has created among students, SI leaders and staff for introducing and continuing the programme in high-risk subjects. SI has contributed to providing a better education to students in selected high-risk subjects, and to developing staff and SI leaders through courses and practical implementation of the material. SI has also stimulated international cooperation through the SI network in Europe in general and specifically within Lund University. The programme has enabled Nord University to make a mark as the first Norwegian university to establish SI, and in that, it has become an SI hub.

The reasons for the university's success in introducing SI were the efforts of enthusiasts and their belief in student involvement and the programme. Network building and external cooperation, particularly with Lund University, have also been decisive. Although the university has little research on SI as of yet, research activity and dissemination have been very important in communicating and highlighting SI. Marketing and disseminating research on SI have also taken place via university newspapers and national news programmes. In retrospect, the success factors at Nord University are:

- Established an SI programme with clear roles based on SI supervisor training, SI handbooks, and collaboration with Lund University.
- Research on the introduction of SI (focusing on participating students and SI leaders) presented at national and international conferences.
- Communicated the case 'From a thirty to zero per cent fail rate,' both internal and to nationwide television, magazines, and newspapers.
- Involving the university management and making clear that SI can respond to national requirements.
- Building a national SI network.

Nord University has not succeeded in:

- Obtaining funding from university administrators for the SI programme and for an SI coordinator. Without a clear foundation in the university strategy to support new students, SI's future success will depend entirely on individuals devoting time outside their working hours.

5. Results from the Cases and Discussion

The two universities give the same reasons for introducing SI (i.e. to help the first-year students and to bridge the gap between secondary and higher education). In this way, qualitative issues were the main reasons for introducing SI. Over the years, we have seen an expansion of SI at both universities. The reasons given for this are primarily

to improve student learning and performance and to provide the students with better learning strategies. The introduction of SI at both universities was related to employees strongly believing in it, and both have prime advocates of SI who have played a crucial role in its implementation.

The two universities differ in their organisation and integration of the SI programme. At Lund University, the programme is organised with the European Centre for SI-PASS as the central unit supporting the different sub-programmes at the faculties. At Nord University, there is still a lack of a clear foundation, despite the fact that the university educates new SI supervisors and that SI is described in the course descriptions of different subjects. SI has not been introduced as part of the universities' strategies and is not sustained by the university management. On the other hand, Nord University is subject to the national policy of student active learning as set out in the 2017 NP Report.

Two common strategies used to implement organisational changes, like an SI programme, are to either take in new people or to change the existing staff. Both strategies can be sensible, but to succeed, the organisation must create new roles and develop new expertise in conjunction with one another. Retraining staff or hiring new staff without changing roles rarely works (Bolman & Deal, 1991). The two universities differ greatly with respect to the development of roles linked to SI. Gaining support for SI among the top management, administration, academic staff, and students is relevant to the successful implementation of the SI programme. Sustained quality teaching policies require long-term efforts and thus call for a permanent institutional commitment from the top management of the institution (Hénard & Rosereare, 2012), as seen at Lund University, where the Vice Dean took a key initiative in 2014. Earlier research shows that strong institutional support and encouragement are necessary to encourage faculty members to try new approaches and learn from what they do (Major & Palmer, 2006). Among other factors, successful adaption of teaching programmes and changes in HEIs rely on the creation of clear institutional direction and policy, increasing awareness and commitment, establishment of a single point of support, quality assurance, and project management (Garrison & Kanuka, 2004).

Since 2016, Lund University has had the overall responsibility for SI in Europe through its establishment of the European Centre for SI-PASS. The university therefore has an overarching role and responsibility for SI that other universities in Europe do not have. This means that Lund University will always be a major SI player. The centre also makes it easier to integrate and develop the SI programme at the university. Lund has, among other steps, developed SI to include upper-secondary schools and cooperates with a number of schools on the transition to higher education. This key role has also provided an external basis for the SI work at Nord University, where the cooperation with Lund has been essential for training SI supervisors and establishing the SI programme.

SI is documented in various ways at the universities, including in research, information material, evaluation reports, faculties' action plans, and the Student Barometer survey. During the implementation, both universities experienced the need

for repeated and targeted information. Nord University, for instance, has a strong collaboration with its Communications Unit, which has been important in the implementation of SI.

Success factors in implementing SI at the universities have been the prime advocates believing in the programme, defined roles, research (documenting SI results), integration, visibility (both within the organisation and externally through conferences, etc.), networks, and for Nord University, a collaboration with the European Centre for SI-PASS at Lund University.

Research at the universities has mainly been conducted by persons involved in the SI programme. This is a natural situation, since both personal/professional interest and the need for documentation can be reasons to carry out research. In this sense, research has been an important part of evaluating the programme. The studies conducted have covered a comprehensive scope of topics, examining issues such as student performance and retention, SI participants' views, and benefits for SI leaders. Results from both universities show that the benefits of SI reach beyond the course the programme is intended to support (Malm, Bryngfors, & Mörner, 2012, 2015; Malm, Bryngfors, & Fredriksson, 2018; Helde & Suzen, 2019). The studies have looked closer at those benefits, such as pedagogical skills, learning strategies, and social networks, among others. Today, the group of students is bigger and more heterogeneous, and SI can be used to de-dramatize and inspire students to take higher education, including where pupils' families do not have an academic tradition. In this respect, it is interesting to see that a study by Malm, Bryngfors, and Mörner (2011b) shows that having a heterogeneous group of students seems to benefit everyone. SI also benefits the SI leaders, and research shows that they highly value the opportunity to experience this role.

The concluding remark about the case study is that success factors at Lund and Nord Universities very much align to the cornerstones in the SI programme (see, for instance, UMKC, 2014). Both HEIs established programmes adhering to the essential elements of SI with:

- active small-group learning programmes led by trained supervisors;
- training and support of senior students as leaders/facilitators;
- cooperation with teachers;
- supplement/complement to regular teaching in high-risk courses with regularly scheduled SI sessions;
- information/communication of what SI is to students, teachers, administration/support staff, and university management; and
- evaluation of the SI programme with feedback to university administration, teachers, administration/support staff, and students.

These factors were central in creating a successful and widely recognized peer support programme. Beyond that it was absolutely crucial to have enthusiasts for SI with entrepreneurial skills and perseverance to establish the SI programmes. Research on the

SI programme and publication of results in peer-reviewed journals and books were also important to obtain acceptance and interest from teaching staff and university management.

6. Further Research

During our work on this study, the coronavirus pandemic made it necessary to close the universities and provide distance education. This meant that SI leaders had to come up with new ways of providing SI. In response to the situation, SI went online at a number of universities. It would be very interesting to take a closer look at the prerequisites for digital SI, its limitations, and the possibilities it creates.

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2 Supplemental Instruction at Higher Education Institutions: A Scoping Review

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Abstract: Higher education institutions (HEIs) play an important role in generating and transferring knowledge. However, dropout rates and weak exam results are worrying. To address these issues, many HEIs have implemented Supplemental Instruction (SI), implying that groups of students meet regularly during the semester under the guidance of an experienced student leader. Considering the widespread implementation of SI, it is important to understand: 1) how SI sessions should be organised, 2) the characteristics of successful SI leaders, and 3) the degree to which SI improves retention rates and exam results. In this study, a scoping review (SR) of articles in the world's largest curated abstract and citation database of research literature – Scopus – is conducted to achieve precisely that. The review found that there is solid evidence of positive effects of SI programmes for the participators, but the results on the digital transformation of this learning activity are not sufficiently addressed. Also, there is a lack of evidence on how these positive effects rely on the programme's organisation. Consequently, there is a need for further studies using control groups faced with different approaches to further reveal the effects. Finally, we find that the role of SI leaders is poorly accounted for in the reviewed literature. Particularly the human aspects of the SI leader seem to be under-researched. These findings are relevant for the future direction of research on SI, specifically, and for peer-assisted learning in general.

1. Introduction

The wealth of nations is, to a great extent, determined by their human capital (Manuelli and Seshadri, 2014), and education is one of the most important investments that can be made in a country's future (Becker, 1964). It is therefore worrying that many students drop out of their college or university programme and that exam results are weak in some courses (Ministry of Education and Research, 2016). Also, the change in role from strict guidance at lower levels of education to own responsibility for progress in education at HEIs can be demanding for many students. It is therefore important for the HEI to support students through this period of transition by considering the needs for both professional development and social interplay (Helde & Suzen, 2019).

When focusing on professional development, many HEIs have implemented Supplemental Instruction (SI) as a measure to improve retention rates and exam results. The SI programme was developed by Dr Deanna Martin at the University of Missouri

in Kansas City in 1973. Since then, SI has spread to more than 1,500 universities and colleges in almost 30 countries (Martin, 2008). SI is a non-traditional form of tutoring that focuses on collaboration, group study, and interaction for assisting students in undertaking 'traditionally difficult' courses. The students who attend SI sessions are responsible for teaching each other the course content and for working together to solve problems.

Each SI session is attended by a group of students, acting as model students, who are enrolled in the target course and facilitated by an SI leader. The SI leaders are an important difference between SI and other peer-assisted support activities (Lockie & Van Lanen, 2008). Typically, leaders are academically successful students with good interpersonal skills who recently completed the course and achieved a good grade (TCAO, 2008). The main role of the SI leader is to facilitate discussion among students participating in the programme. Moreover, the SI leaders are recruited, trained, and supported by an SI supervisor who is also trained within the framework of the programme (Dawson et al., 2014). The SI supervisor is neither part of the faculty teaching the course nor in direct contact with the students participating in the SI sessions. These participants – students, SI leaders, and the SI supervisor – interact with the faculty teaching the course that is supported by the SI programme.

There is a well-developed body of literature studying a variety of topics related to SI. This includes review articles, which have usually focused on specific aspects of the programme. For example, the review by Dawson et al. (2014) focused only on the effectiveness of SI and a restricted time span. On the other hand, Stout and McDaniel (2006) reviewed the evidence on benefits for the SI leaders gained by participating. Consequently, there is a need for a more holistic view of the literature considering the most recent publications.

We have taken the approach of a scoping review, which is a relatively new addition to the options for a literature search (Davis et al., 2009). This type of scoping review facilitates the identification of gaps in the evidence base where no research has been conducted, with the potential to summarize and convey findings, as well as identify the relevance of the need of a systematic review or otherwise (Arksey & O'Malley, 2005).

The aim of this study is to use the scoping review to examine the scientific literature on SI at higher education institutions to reveal knowledge gaps. Having in mind the discussion above, we address how SI sessions should be organized to obtain the objectives, what characteristics an SI leader should have, and whether the implementation of SI at HEIs has led to improved retention rates and exam results. Specifically, the research questions (RQs) are formulated as follows:

- RQ1: How should SI sessions be organized to achieve the programme's objectives?
- RQ2: What are the characteristics of successful SI leaders?
- RQ3: How well does SI succeed in contributing to achieving its main objectives of improving retention rates and exam results?

The knowledge gained from this study will be relevant for institutions considering implementing SI as a pedagogical measure to improve retention rates and exam results. Moreover, the scoping review provides input to the research community by suggesting knowledge gaps to be addressed in future studies.

The next section presents how the structure of the scoping review is applied in this study. Then, in Section 3 we present findings from the reviewed literature related to the three research questions. In Section 4 we discuss knowledge gaps and accounts for the validity beyond that of the individual research questions. Finally, in Section 5 we provide some concluding remarks.

2. Method

As mentioned in Section 1, this study applies the scoping review (SR) method. This is a method increasingly used to identify knowledge gaps, set research agendas, and identify implications for decision-making. Specifically, we broadly follow the five stages in the methodological framework proposed by Arksey and O'Malley (2005): 1) identify the research questions, 2) identify relevant studies, 3) study selection, 4) charting the data, and 5) sorting, summarizing, and reporting the results. The procedures we have followed are presented in more detail below.

2.1 Identifying the Research Questions

The primary focus of this study is on the use of SI at HEIs. It was determined that the RQs presented in Section 1 should be answered.

2.2 Identifying Relevant Studies

An SR should be as comprehensive as possible in identifying studies that can contribute to answering the research questions (Arksey & O'Malley, 2005). Consequently, we decided to search for relevant literature in the world's largest curated abstract and citation database of research literature (Schotten et al., 2017) – Scopus. The primary search term used was 'supplemental instruction', and for a document to end up in our search results, this primary search term would have to be either in the title (TITLE), the abstract (ABS), or in the keywords (KEY). This was done to increase the likelihood that SI was a key concept in the documents our search returned.

Due to limited coverage in Scopus, only studies published after January 2000 were included. In doing so, we ensure that the most recent and timely studies are examined. The search string employed also limited our results to documents written in what many consider the language of science, namely, English (Lillis et al., 2010). Finally, the documents generated by our search would also have to be published in a journal. This was done to increase the likelihood that the documents included in our study have

gone through a review process. The search was conducted on January 23, 2020, and the query string used is shown in Table 1.

Tab. 1: Search terms employed

	Search term
Concept	(TITLE-ABS-KEY("supplemental instruction"))
Time of publication	AND (LIMIT-TO (PUBYEAR,2020) OR LIMIT-TO (PUBYEAR,2019) OR LIMIT-TO (PUBYEAR,2018) OR LIMIT-TO (PUBYEAR,2017) OR LIMIT-TO (PUBYEAR,2016) OR LIMIT-TO (PUBYEAR,2015) OR LIMIT-TO (PUBYEAR,2014) OR LIMIT-TO (PUBYEAR,2013) OR LIMIT-TO (PUBYEAR,2012) OR LIMIT-TO (PUBYEAR,2011) OR LIMIT-TO (PUBYEAR,2010) OR LIMIT-TO (PUBYEAR,2009) OR LIMIT-TO (PUBYEAR,2008) OR LIMIT-TO (PUBYEAR,2007) OR LIMIT-TO (PUBYEAR,2006) OR LIMIT-TO (PUBYEAR,2005) OR LIMIT-TO (PUBYEAR,2004) OR LIMIT-TO (PUBYEAR,2003) OR LIMIT-TO (PUBYEAR,2002) OR LIMIT-TO (PUBYEAR,2001) OR LIMIT-TO (PUBYEAR,2000))
Language	AND (LIMIT-TO (LANGUAGE,"English"))
Type of publication	AND (LIMIT-TO (SRCTYPE,"j"))

2.3 Study Selection

The query presented in Table 1 returned 169 documents from the Scopus database. We read and assessed the abstracts of all articles. To be included in the additional process, we had to be able to answer 'yes' to the two following questions: 1) is the article related to higher education?, and 2) is the article about Supplemental Instruction, as it is presented in the Introduction of this chapter? Following this, about one-third of the articles were considered irrelevant for our study. The main reason for being excluded was that the article was related to, for example, kindergarten, elementary, or

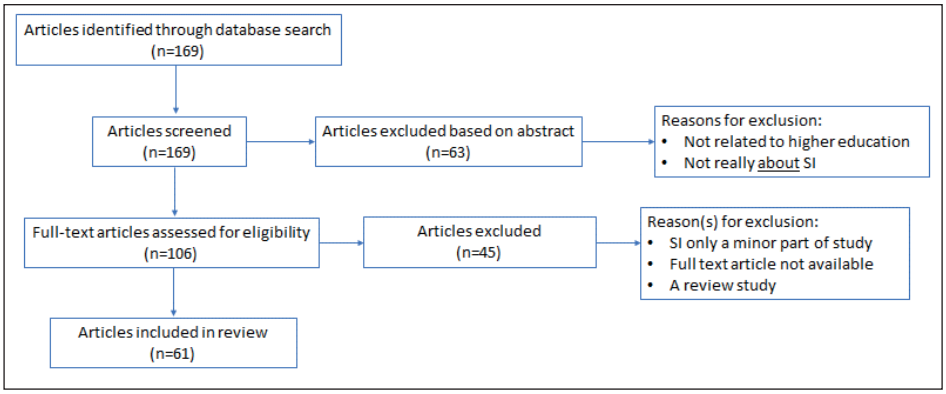

Fig. 1: Search process

high school. Full-text versions of the 106 remaining articles were sought, but we were unable to retrieve full-text versions of four articles. Of the 102 full-text articles that we read, 41 were excluded because SI was only briefly mentioned, or because it was a review study. The search strategy left us with 61 articles for our review; the selection process is illustrated in Figure 1.

2.4 Charting the Data

In the fourth stage of the framework of Arksey and O'Malley (2005), we documented data related to each article included in our analysis. The data that we stored in Excel included the names of the authors, publication year, article title, and the field of study. Moreover, citation information was stored in the software tool EndNote X9. The articles included in the analysis are listed in Table 2.

Tab. 2: Overview of selected studies (sorted in alphabetical order after year of publication)

Author (Year)	Name of journal [a]	Field of study
Etter et al. (2000)	J ACCOUNT EDUC	Accounting
Howitt and Harding (2000)	ASIAN R ACCOUNT	Accounting
Hodges et al. (2001)	J COLL READ LEARN	History
Bushway and Flower (2002)	INTL J PHYTOREMEDIATION	Statistics
Hensen and Shelley Ii (2003)	J COLL STUDENT DEV	Various fields
Hurley et al. (2003)	MED TEACH	Medicine
Zulu (2003)	AILA R	Law
Hurley et al. (2006)	NEW DIR TEACH LEARN	Various fields
McGuire (2006)	NEW DIR TEACH LEARN	No particular
Moore and LeDee (2006)	J COLL READ LEARN	Biology
Painter et al. (2006)	NEW DIR TEACH LEARN	Various fields
Peters et al. (2006)	J WOMEN MINOR SCI ENG	Various fields

Author (Year)	Name of journal [a]	Field of study
Zaritsky and Toce (2006)	NEW DIR TEACH LEARN	Various fields
Zerger et al. (2006)	NEW DIR TEACH LEARN	Various fields
Peterfreund et al. (2007)	J COLL STUDENT RET: RES, THEO PRACT	STEM
Rath et al. (2007)	CBE-LIFE SCI EDUC	Biology
Fayowski and MacMillan (2008)	INT J MATH EDUC SCI TECHNOL	Calculus
Ning and Downing (2010)	STUD HIGH EDUC	Business
Drake (2011)	COLL TEACH	Various fields
Harding et al. (2011)	INT J MATH EDUC SCI TECHNOL	Mathematics
Terrion and Daoust (2011)	J COLL STUDENT RET: RES, THEO PRACT	Various fields
Malm et al. (2012)	STUD HIGH EDUC	Engineering
Price et al. (2012)	J COLL READ LEARN	Psychology
Rath et al. (2012)	J CHEM EDUC	Chemistry
Grillo and Leist (2013)	J COLL STUDENT RET: RES, THEO PRACT	Various fields
Lockie et al. (2013)	J PROF NURS	Nursing
Mosley et al. (2013)	CURRENTS PHARMACY TEACH L	Pharmacy
Dancer et al. (2014)	STUD HIGH EDUC	Business
Goldstein et al. (2014)	ACCOUNT EDUC	Accounting
Goomas (2014)	C COLL J RES PRACT	Psychology
Tangwe and Rembe (2014)	MEDITERR J SOC SCI	Various fields

Author (Year)	Name of journal[a]	Field of study
Wilson and Rossig (2014)	INTL R ECON EDUC	Various fields
Clark and May (2015)	C COLL J RES PRACT	Nursing
Goomas and Isbell (2015)	C COLL J RES PRACT	Various fields
Malm et al. (2015)	EUR J ENG EDUC	Engineering
Naidoo and Paideya (2015)	S AFR J EDUC	Various fields
Okun et al. (2015)	EDUC PSYCHOL	Psychology
Rabitoy et al. (2015)	J HISPAN HIGH EDUC	STEM
Summers et al. (2015)	J COLL READ LEARN	History
Bruno et al. (2016)	ANAT SCI EDUC	Human anatomy
Chan et al. (2016)	PERANIKA J SOC SCI HUM	Various fields
Malm et al. (2016)	EUR J ENG EDUC	Engineering
Paloyo et al. (2016)	ECON EDUC REV	Various fields
Alden (2017)	J CHEM EDUC	Chemistry
Attridge et al. (2017)	PHARM EDUC	Pharmacy
Guarcello et al. (2017)	TECHNOL KNOWL LEARN	Psychology
Harrison et al. (2017)	MED SCI EDUC	Medicine
Hizer et al. (2017)	J SCI EDUC TECH	Biology
Im et al. (2017)	INT J SCI MATH TECH LEARN	Mathematics
Musah and Ford (2017)	J RES EDUC EFFECT	Chemistry

Author (Year)	Name of journal [a]	Field of study
Cobb et al. (2018)	INT R ECON EDUC	Various fields
Mitra and Goldstein (2018)	INFORMS T EDUC	Business
Owens et al. (2018)	J HEALTH CARE POOR UNDERSERVED	Human anatomy
Allen et al. (2019)	ACTIVE LEARN HIGH EDUC	Various fields
Balzer Carr and London (2019)	J COLL STUDENT RET: RES, THEO PRACT	Various fields
Buchanan et al. (2019)	J EXP EDUC	Various fields
Lozada and Johnson (2019)	J TRANSFORMATIVE EDUC	Various fields
Paabo et al. (2019)	J COLL STUDENT RET: RES, THEO PRACT	Various fields
Trate et al. (2019)	J CHEM EDUC	Chemistry
Channing and Okada (2020)	C COLL J RES PRACT	Various fields
Hickey et al. (2020)	INT HIGH EDUC	Chemistry

[a] Abbreviations from Caltech Library (https://www.library.caltech.edu/journal-title-abbreviations).

2.5 Sorting, Summarizing, and Reporting the Results

At the fifth stage of the framework suggested by Arksey and O'Malley (2005), the findings from the SR are sorted, summarized, and reported. Broadly, this is done in the remainder of this chapter. Specifically, how SI sessions should be organised is reported in Table 3, the characteristics of successful SI-leaders are reported in Table 4, and the degree to which SI contributes to higher retention rates and better exam results is reported in Section 3.3.

3. Findings

This scoping review yielded, as mentioned earlier, 61 articles addressing a number of subjects. Of these, 15 were related to biology and health, 14 to STEM, 6 to business and accounting, and 26 to various topics, such as law and history, or covering more than

one subject. The majority of the studies related to universities in North America, with some exceptions, such as studies from South Africa. In this section, we present the findings related to the three research questions.

3.1 How Should SI Sessions be Organized?

When compared with other academic support interventions, SI programmes are organized somewhat homogeneously and according to recommendations provided in handbooks (e.g. Alyea & Gutierrez, 2017). Consequently, all programmes accounted for are characterised by voluntary participation, no tuition fee, and tutoring by trained SI leaders. Still, the literature accounts for a variety of approaches within the framework of SI. We find some differences in aspects such as duration, number of participants, number of parallel sessions, sign-up rules for attending, training programme for leaders, and involvement of faculty. Table 3 provides examples of the diversity in how SI sessions are organized.

Tab. 3: Variation in organisation between universities – examples from the reviewed articles

Source (example)	Relevance	Explanation
Hodges et al. (2001)	Group size	Groups were established with 10–12 students each
Peterfreund et al. (2007)	Duration	SI classes held once a week for an hour and a half
Fayowski and MacMillan (2008)	Early start up	Implemented during the first 2 weeks
Hurley et al. (2003)	Sign-up routines	Sign-up sheets several days prior to each session
Etter et al. (2000)	Timing of sessions	Scheduled close to the class time and in same building
Malm et al. (2012)	Scheduling	Scheduled during normal school hours (8 am to 5 pm)
Bruno et al. (2016)	Faculty involvement	SI leaders attended all course lectures and met with the SI supervisor on a weekly basis to discuss their ideas related to session content and organisation
Wilson and Rossig (2014)	Incentivizing	Participating at the SI programme gives student credit

Let us elaborate on the information in Table 3. First, the duration of sessions is within the range of 50 minutes to 2 hours, with most studies reporting 90 minutes. The group size is usually between five and ten students per tutor as reported, for example, by Hurley et al. (2003). With respect to scheduling of SI courses, an example is given in

Table 3 on the timing close to the lecture given by the faculty. Etter et al. (2000) also mention the physical location being close to the usual teaching facilities. It could be challenging to find suitable times for the SI programme, and Summers et al. (2015) gave an example where a survey was administered to determine SI session times that would work well with students' schedules. The SI courses are usually offered without any credit incentives, but there are exceptions, such as accounted for by Wilson and Rossig (2014), directing particular attention to underrepresented minorities.

3.2 What are the Characteristics of Successful SI Leaders?

As argued in the Introduction, we are not aware of any previous scoping reviews focusing on the characteristics of SI leaders that increase students' ability to reach their learning objectives. In the articles, there is surprisingly little information about this. Of the studies accounting for the selection of SI leaders, the main focus is on topical knowledge measured by grades (e.g. Goomas, 2014). We also observe that while some articles refer to the tutors as SI leaders, others use the term SI facilitators (e.g. Rath et al., 2012). A selection of topics addressing the SI leaders is presented in Table 4.

Tab. 4: Selected characteristics of successful SI leaders addressed in the articles

Example source	Explanation
Goomas (2014)	Good topical knowledge
Summers et al. (2015)	Training of SI leaders
Hodges et al. (2001)	Observed and receiving feedback
Rath et al. (2012)	Human aspects making SI leaders suited to the role

The most commonly reported criteria when selecting SI leaders is good topical knowledge. This is measured by earlier achievements in the course and, for example, reported by Goomas (2014) to be earning a grade of A or B. Other criteria are also mentioned by a few articles, such as Lozada and Johnson (2019), introducing a case where SI leaders were recruited by friends who had earlier served in the role.

A key element of a successful SI programme seems to be the extensive SI leader training, particularly in group facilitation practices, including the use of proactive and participative activities in the sessions (University of Wyoming, 2014). For the SI leaders, participation in the programme will have some similarities with leader development programmes (Lund Universitet, 2017). When working with education, it is important to reflect on our own performance and practice (Schön, 2009). Hence, to further develop skills in leadership and pedagogy, the future SI leader must be willing to analyse and evaluate their own performance. The training programmes for new SI leaders vary but are usually arranged as intensive courses at the beginning of the semester. For example, Hodges et al. (2001) explained that one provided 3 days of training using the SI model. In the context of history subjects, Summers et al. (2015)

account for 16–18 hours of training during the start of the fall semester. This was complemented by monthly training sessions during the semester.

Only few articles examine the role of SI leaders and account for continued observation of the performance and feedback during the duration of the SI programme. In the case of Summers et al. (2015), SI leaders were observed during a session and later were provided with individualized feedback in regards to their strengths and areas for improvement.

Routines for observation and feedback were accounted for by Hodges (2001), where SI leaders attended regularly scheduled weekly meetings with the SI supervisor, the course instructor, or both. Each SI leader was also observed at least three times during the semester by the SI supervisor or staff to receive feedback and facilitate their growth as an SI leader.

The leaders' attitudes towards other people, including their emotional intelligence, is often raised as an important attribute in research on leadership (Goleman, 1998). The last entry in Table 3 addresses the somewhat more intangible part related to interpersonal skills, making students who have graduated earlier suitable to undertake the role as SI leaders. These relational competencies are only rarely reported in the reviewed literature. The article by Rath et al. (2012) is one notable exception, accounting for the use of information other than topical knowledge (i.e. top grades) when selecting SI leaders. At the mid-sized public university studied by Rath et al. (2012), the faculty member selected SI leaders based on their maturity, personality, and competency with active learning approaches, as determined through interviews and conversations with faculty members familiar with them.

3.3 How Well Does SI Achieve Its Objectives of Improving Retention Rates and Exam Results?

The reviewed articles argue that there is a strong positive effect on retention rates and exam results of participating in the SI courses. This result seems to be valid for both weak and strong students. However, evidence indicates that benefits are particularly strong for weaker students (Buchanan et al., 2019) and underrepresented minorities (Wilson & Rossig, 2014). There is also a gender dimension that is somewhat ambiguous, where some studies find no specific pattern (e.g. Fayowski & MacMillan, 2008) while others find that males benefit the most (Peterfreund et al., 2007).

The problem of selection bias is raised in a number of studies that explore the degree to which the results can be trusted. It is argued that even though it is evident that the success rate is higher for students attending the programme, it cannot be ruled out that it is the most motivated and skilled students that attend the SI seminars. In the reviewed literature, this bias has been controlled for by correcting for prior GPA scores (e.g. Fayowski & MacMillan, 2008) or by including variables on the backgrounds of the students in the statistical analysis (e.g. Bushway & Flower, 2002).

4. Discussion

We have raised a number of findings from the reviewed literature in Section 3 related to each of the three research questions. The findings are, however, related to each other. First, it is interesting to observe that within the strict limits of the SI programme we still find considerable variations in how sessions with students and training of leaders are organized. Even with the variations accounted for in sections 3.1 and 3.2, all programmes do, to some degree, report improved retention rates and performance measured by academic grades. This is interesting, but to gain a deeper understanding of the mechanisms and to give advice on how to best organise sessions, we need to know what is the best approach under a given set of circumstances.

We find little evidence, however, of how variations in the organisation of SI programmes influence outcomes. One question could be: is it better to hold fewer and longer sessions, than the opposite? Another question might be: should SI leader training be intensive at the start, or should it run through the duration of the semester? To reveal these relationships it might be necessary to conduct experiments where students and leaders are separated into treatment groups. These groups are then treated with different variations of the SI programme. Such a research project would require significant resources and could call for support from public funding programmes and involve interdisciplinary research groups at several universities. Such an extensive study would also, to a large extent, correct for selection bias compared to the results most frequently reported for individual courses or programmes in the current literature.

We would also like to raise the lack of focus on the role of SI leaders in the existing research. Similar to the topic organisation addressed above, the degree to which the outcome is successful for students due to different characteristics of SI leader training should be studied more thoroughly. Most articles report on academic achievements, and some on aspects of training. Only a few studies raise the importance of good relations between SI leaders and faculty throughout the duration of the SI programme. However, we would like to point out the lack of emphasis on the human aspects that make a student with good topical knowledge well suited to conduct training for younger students. In such an interpersonal role, there are many relational competencies that should be addressed. The importance of the students' relations to the tutors, labelled the relational turn in the social science tradition (Colbert et al., 2016), has recently attracted attention both in the education policy debate and within the pedagogical research (Ministry of Education and Research, 2016). One reason is the developing literature documenting the importance of the relationship between tutor and student (e.g. Skinner et al., 2008). The quality of the relations between tutor and student can therefore have a substantial impact on the learning outcomes and overall experience of the education process.

Consequently, improving and extending the criteria for selecting candidates for the role as SI leaders to include interpersonal relational competence might improve the benefits of the sessions even more without imposing considerable negative conse-

quences, such as higher costs. However, the perception of what is considered suitable competence might vary somewhat between people, and this must be kept in mind when deciding on the members of the committee handling the hiring process. To an even greater extent than for SI leaders, there seems to be a lack of focus in the reviewed literature on SI supervisors.

Finally, we would like to address two lessons to be learned from the scoping review of the literature. The first deals with geography. It seems that evidence stemming from this particular peer-assisted programme is most thoroughly documented in North America. There are some studies from around the world, but there is clearly a need to gather experiences globally to reveal how the SI programme can be implemented across cultures and contexts. The second deals with the recent development towards the digitalization of society. One event emphasising this development is the novel coronavirus (COVID-19), which to varying degrees closed down universities globally and made it impossible to carry out physical meetings. In the reviewed literature, there is virtually no mention of digital solutions to the SI programme. Digitalization can be implemented for meetings with students and provides opportunities for improving the training of SI leaders and interaction with SI supervisors and faculty.

5. Concluding Remarks

The overall purpose of this chapter has been to examine the scientific literature on SI at HEIs by means of the scoping review methodology. Following a search of Scopus, 61 articles were identified as relevant for our study.

Our three most important findings related to how SI sessions ought to be organized are: 1) the sessions should be arranged during normal schooling hours to make it easier for students to attend; 2) students participating in SI sessions should receive credits to incentivize participation; and 3) faculty should be involved because it allows course and SI leaders to share ideas and experiences that can improve both the traditional lectures and the SI sessions.

When it comes to the characteristics of successful SI leaders, our most important findings are: 1) they should be well trained in their role by participating in a training course before becoming an SI leader and receiving continuous training and feedback during the semester to attain the necessary skills; 2) they ought to have good grades in the course for which they function as a leader, indicating strong knowledge of the topics and, as such, a good ability to answer questions from SI participants; and 3) they must have good interpersonal skills. This includes having the ability to empathize with students who struggle in a course, keep their commitments, and be willing and able to provide helpful feedback.

Finally, our review indicates strongly that SI participation has a significant positive effect on retention rates and exam results. Additionally, these effects seem to be strongest for weak students, minorities, and men. We therefore are confident that, for

institutions struggling with poor grades and low retention rates, it would be beneficial to implement SI.

The aforementioned findings demonstrate that the effects of SI participation are well documented, for students in general and for select groups. However, there are still some knowledge gaps that ought to be addressed in future studies. First, the most important knowledge gap is related to the human characteristics required for SI leaders to perform well in their role. The current body of literature mainly focuses on the need for SI leaders to have topical knowledge, but it is also important to know how to identify potential SI leaders who are able to reach out to SI participants and help them during their interactions. Second, even though the SI programme in general is successful, there seems to be a lack of knowledge regarding how variations in organisation and SI leader training influence retention rates and exam results. Hence, future studies should investigate these relationships in more depth. Third, the spread of COVID-19 in the spring of 2020 has clarified the need for knowledge on how SI sessions can be arranged digitally. By making SI digital, it will also become more accessible for students who are unable to show up on campus.

This study does have some limitations. It is, for example, worth noting that our review is based on literature retrieved from only one database – Scopus. Although this is the largest curated abstract and citation database in the world, Google Scholar is an even more comprehensive academic search engine (Gusenbauer, 2019). Thus, Google Scholar would likely generate broader search results. However, many of the listings in Google Scholar are not peer-reviewed and can therefore be of lower scientific quality (Aguillo, 2012). In our study we have also followed the recommendation made by Arksey and O'Malley (2005) of not assessing the quality of the studies included in a scoping review. This, of course, limits the degree of evidence that studies like this provide (Larsen et al., 2017). Nevertheless, we believe that this study provides novel and useful knowledge related to the implementation and use of Supplemental Instruction, specifically in peer-assisted learning, and in higher education in general. If implemented, this knowledge can improve the return on the vast public investments that are made in education.

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3 Supplemental Instruction (SI) – Learning Leadership and Leadership Development

Roger Helde

Abstract: The topic of this chapter is the student-active form of learning Supplemental Instruction (SI), and the students who lead the SI sessions – the SI leaders. Increased leadership competence for SI leaders is highlighted in descriptions of the SI programme (Helde & Suzen, 2019), but relatively few studies focus on SI leaders with respect to the leadership dimension. This article takes a closer look at how SI leaders learn leadership through the SI programme, and presents the results of a survey and interviews conducted among SI leaders at Nord University Business School, Road Traffic Division, in 2017. The main focus of this chapter is on whether and how SI leaders have learnt leadership, understood their role as leaders, and experienced development as leaders in the context of the SI programme. The research question is: what is SI leaders' understanding and experience of the SI programme's contribution to learning about leadership and leadership development?

1. Introduction

Supplemental Instruction (SI) is a professional support programme that aims to improve students' performance and reduce dropout rates by employing cooperative learning strategies (Arendale, 1994). SI was developed in 1973 by Dr Deanna Martin of the University of Missouri, Kansas City. Employees from more than 1,500 universities and university colleges in over 29 countries have been trained to use SI (Martin, 2009). Every year, SI is offered to hundreds of thousands of students (Arendale, 2002). When Nord University was established in 2016, the SI programme was introduced at Nord University Business School, in the physics course of the Road Traffic Division. Nord University has a partnership with Lund University, which is the European Centre for SI supervisor training (SI-PASS). The programme at Lund is regulated through an agreement with the University of Missouri in Kansas City, which is the international development centre for the SI programme.

SI is often linked to specific high-risk courses (Martin & Arendale, 1993). The term 'high-risk course' can be interpreted differently, but such courses may share the following characteristics:

> Large amounts of weekly readings from both difficult textbooks and secondary library reference works, infrequent examinations that focus on higher cognitive levels of Bloom's taxonomy, voluntary and unrecorded class attendance, and large classes

> in which each student has little opportunity for interaction with the professor or the other students. (Arendale, 1994, pp. 11–12)

SI programmes are offered as a supplement to the ordinary teaching programme, enabling students to focus on and discuss course material that they find difficult to understand in a safe environment. The programmes are open to everyone who wants to improve their ability to achieve better results in an individual course. One important difference between SI and other group work is the SI leader (Lockie & Van Lanen, 2008). The SI leader is an experienced student who was awarded a good grade in the subject, and thus serves as a role model for new students. The SI leader's job is to structure the sessions and initiate cooperative exercises to review the material. SI leaders do not teach or go through the lectures, but help the SI participants to find the answers themselves. This is based on an approach to learning where inner motivation and curiosity are the key drivers, and where the focus is on cooperative learning. SI leaders ask questions and counter questions, but do not answer the questions.

> During SI sessions, the subject content (what) is integrated with an understanding of the learning process that provides knowledge about critical investigation, a logical approach and study strategies (how) that are appropriate for the subject. The SI programme seeks to enable students to see learning in a bigger perspective and find the motivation to keep learning (why). (Helde & Suzen 2019)

SI supervisors are responsible for coordinating the implementation of the SI programme. This involves training of and follow-up with SI leaders. During the semester, SI leaders have regular meetings with SI supervisors, either jointly or individually. The SI leader's cooperation with the lecturer for the course is important, and SI leaders should be up to speed with the lectures the students have had.

Other articles provide more detailed descriptions of the SI programme's theoretical basis (Blanc, DeBuhr, & Martin, 1983; Arendale, 1994; Hurley, Jacobs, & Gilbert, 2006; McGuire, 2006; Martin, 2008; Helde & Suzen 2019).

Descriptions of the SI programme emphasise how SI leaders acquire increased leadership skills (Helde & Suzen, 2019). However, relatively few studies focus on SI leaders and the leadership dimension, and the experience and skills they acquire through this programme (Lockie & Van Lanen, 2008; Malm, Bryngfors, & Mörner, 2012). One study of SI leaders by Congos and Stout (2003) examined the advantages of SI leadership after graduation with respect to interpersonal factors, leadership, learning, and work-related skills. Couchman (2009) describes leadership as a personal experience, and refers to van Manen's 'lived experience' term when she argues that SI leaders' personal experiences must be investigated.

> As our SILs [SI leaders] are engaged in a pedagogical process, it is their 'lived experience' and practical actions of everyday life captured in text that provide especially pertinent and powerful data. (p. 88)

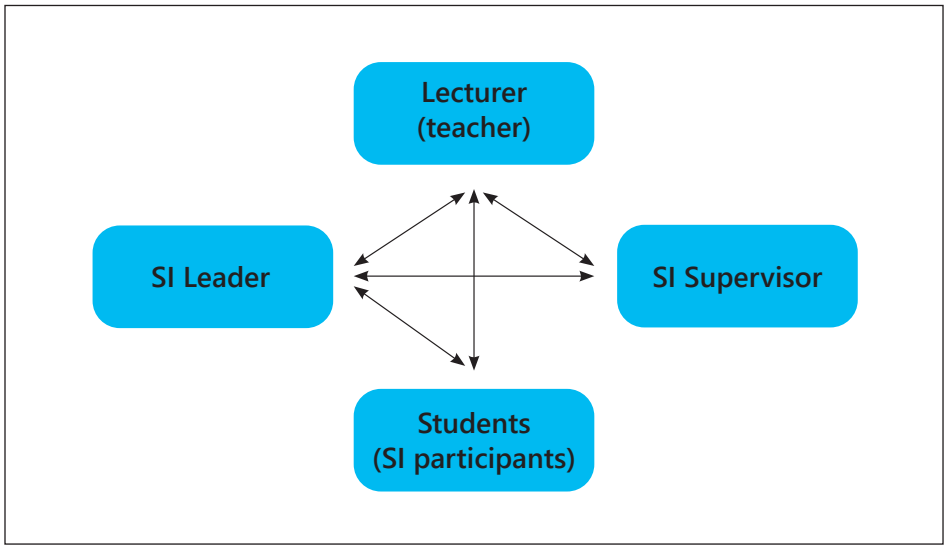

Fig. 1: Key resources in the SI programme. The figure shows the interaction between the different roles. The arrows demonstrate that it is t*he Lecturer and SI Leader who have direct contact with the s*tudents. (The figure was translated into English, from '*SI Supervisor training 26–28 March 2017*' at Lund University in Sweden, led by Leif Bryngfors, Arthur Holmer, and Joakim Malm).

Malm, Bryngfors, and Mörner (2012) conducted a study that addressed the transferability of SI leaders' characteristics and skills to working life. Helde and Suzen (2019) researched SI leaders' understanding of SI as an educational tool and as a leadership development programme. The conclusions from these studies show that SI leaders develop leadership skills, but they also identify the need for more research.

In the following, I examine the students who become SI leaders, and how the SI programme helps to increase their leadership skills. The research question is thus:

- What is SI leaders' understanding and experience of the SI programme's contribution to learning leadership and leadership development?

This question is supported by three sub-questions:

- How have SI leaders learnt leadership in the SI programme?
- How have SI leaders understood the SI leader role?
- How have SI leaders understood and experienced that the SI programme contributes to leadership development?

The main focus of this chapter is on whether and how SI leaders have learnt leadership, understood their role as leader, and experienced development as leaders in the context of the SI programme. I first set out some of the overarching insights in the leadership discipline, and then provide a description of the SI programme at Nord University Business School. I describe the method and explain the data and my role

as researcher. In the results section, I present the findings from a survey questionnaire and interviews conducted among SI leaders at Nord University in 2017. I then discuss what the findings mean in the discussion section, and answer the questions I initially posed. The chapter is based on empirical data and experiences from the SI programme in the physics course at the Road Traffic Division at Nord University; it highlights both the theoretical and practical aspects of the SI leaders' learning of leadership and leadership development.

2. Leadership, Learning of Leadership, and Leadership Development

Leadership is the art of getting things done through other people (Tannenbaum et al., 1961). Classroom leadership in educational practice is about organising teaching in groups of students in classes. To ensure that the students focus on learning, it is vital that teachers lead the activity in a manner that supports learning. The term 'classroom leadership' can be linked to a certain extent to an American tradition related to classroom management (Kreijsler & Moos, 2008). However, it is more closely linked to the relational and dialogical aspect, while 'classroom management' is associated with administration. Classroom leadership is about creating an environment that promotes both academic and social learning (Evertson & Weinstein, 2006; Hattie, 2009; Wubbels, 2011). The teacher as leader helps to engage students in learning work, which makes learning easier for each student (Ogden, 2004). How the teacher practises classroom leadership can potentially make a difference to the students' learning outcomes (Marzano, 2009).

Leadership in teaching practice is both about preparation and the sessions with the students. This leads to a twofold teaching challenge where reflection in and on practice is essential (Schön, 1983). Authority is a key term in the leadership of teaching practice. The leader's authority is a result of cooperation or interaction with the students. It may be expedient in relation to the role of leader to split the term authority into three dimensions: institutional authority, professional and academic authority, and personal authority (Helde & Suzen, 2019). Institutional authority is the dimension of authority assigned to the position of leader. Professional authority is based on the leader's professional knowledge and skills, and personal authority is based on the SI leader's personality.

Leadership practice is based on theory – whether the theory has been personally developed, is research based, or is a combination of the two (Martinsen, 2015). I now explore some of the overarching insights on learning leadership and leadership development.

Learning leadership and leadership development can be based on five strategies: learning through transfer, learning through doing, learning through observation, learning through self-reflection, and learning through feedback (Berg, 2000). Learning through transfer can be achieved by listening to lectures or reading books. This

involves someone transferring their knowledge to a person without it. This form of learning is passive and intellectual. The participants can gain an introduction to and overview of a topic, and an understanding of models, terms, and theories. This model can be important for understanding at an early stage of the learning process. Learning by doing means that the learning takes place in a work-related case, or role-play situation. This form of learning is achieved by trial and error, where the individuals themselves or others give their opinion of the leadership demonstrated in the situation in question. Learning can also take place through active participation. Learning through observing others, which is also known as model learning, involves the observer learning by watching how other people perform tasks. Learning through self-reflection takes place by thinking through different situations involving an individual's own leadership. They conduct an analysis of their own experiences, and think through the mistakes they have made and why their own leadership has been successful in other cases. This is a form of active intellectual learning where the individual analyses their own leadership experience. Learning through feedback can take place through a leader group sharing their common experiences. This is a form of confrontational learning where feedback is the most important element. If a leader group succeeds in creating a safe and open learning environment for leadership development processes, confrontational learning will help to make the individual leader more confident in their role.

Leadership development can be defined as an extension of individuals' capacity to be effective in leadership roles and processes (Day & Dragoni, 2015). Improving individual and collective abilities to engage in leadership processes is an important aspect of leadership development (McCauley et al., 2010). Leadership development is about strengthening leaders' knowledge and skills, and also about promoting their personal development and understanding of how they function in the role of leader. If a leader during the course of exercises and leadership training, or in their leadership practice, acquires experiences that differ from those expected, this will trigger more reflection on this experience and what it means. This interaction between experiences and reflection can be seen in the context of what Schön (1983) referred to as the reflective practitioner.

The purpose of learning processes and leadership training programmes is to bring about a permanent change, and to focus on how to facilitate experience-based learning. Edgar Schein (2004) makes the following claim:

> The key to learning is to get feedback and to take the time to reflect, analyze, and assimilate the implications of what the feedback has communicated. A further key to learning is the ability to generate new responses; to try new ways of doing things and to obtain feedback on the results of the new behavior. This takes time, energy, and resources. A learning culture must therefore value reflection and experimentation, and must give its members the time and resources to do it. The learning leader must both believe in the power of learning and personally display an ability to learn, by

seeking and accepting feedback and by displaying flexibility of response as conditions change. (p. 395)

3. Description of the SI Programme at Nord University Business School in the Physics Course, 2017

Physics is one of the courses that Nord University Business School, Road Traffic Division, has categorised as a high-risk course in the Driving Instructor Education programme. The course forms part of the Technology TLB110 programme, together with the course in car technology, and the physics exam is the first exam the students sit in the programme. This is a basic course on key terms and dimensions in physics, which are important for explaining safe and environmentally friendly driving, and securing loads on vehicles. In autumn 2017, there were 100 students enrolled in the physics course.

Nord University has a partnership with Lund University, and course material from Lund University (2017a, 2017b) is used in the SI programme at Nord University Business School. The course material does not provide a conclusive answer to understanding learning, but the teaching principles and ideas in the SI programme are clearly related to social constructivism (Helde & Suzen, 2019).

Two aspects of the SI programme at Nord University Business School are not covered by the original course material from Lund University. Firstly, the SI leaders undergo a period of practical training immediately after completing the course and before they start holding SI sessions for first-year students. Secondly, the SI sessions can be led by two SI leaders who take turns cooperating with their counterparts.

The SI leaders in this SI programme in physics were second-year students who had been awarded a grade of A or B in the course, and who had completed SI leader training at Nord University. The seven SI leaders completed the leader training in spring 2017. In autumn 2017, 40 SI sessions in physics were held. The SI sessions were led by two SI leaders, and the seven SI leaders thus had the opportunity to lead 10–15 sessions each.

3.1 Training of SI Leaders

The SI supervisors at Nord University have trained at the European Centre for SI-PASS Lund University in Sweden, and are responsible for training new SI leaders. The course for new SI leaders at Nord University is held over two days, and comprises short plenary lectures followed by group work and role play. The course participants are placed at different tables and are immediately asked to reflect and work actively on the issues presented by the instructor. They start by discussing the issue with the person sitting beside them, and then discuss it around the table before finally summing up the issue in plenum.

The following topics are on the agenda during the course: why SI, presentation and expectations, who are today's students, and what is SI? The SI leaders are expected to discuss the educational basis for the SI programme. This is followed by an explanation of what constitutes a high-risk course, how the students perceive high-risk courses, and a description of the key SI resources and their roles. The last part of the course involves training in SI sessions, including planning and implementing SI sessions using observation methods where the course participants are assigned different roles as SI leader, SI supervisor, or student. The SI leaders of the course at Nord University also take a personal test on their own learning and leadership. Time is set aside after the test for self-reflection and group discussions.

3.2 Practical Training and Preparation for the Start-up of SI Sessions

The seven SI leaders underwent practical training in May and June 2017, where they organised SI sessions for students in their own physics class who were taking the resit examination. The SI leaders led the sessions either in pairs or in a group of three leaders.

When the SI leaders returned at the start of the semester in August 2017, they had a two-hour kick-off meeting with the SI supervisor, where they devised concrete plans for the autumn SI programme. The importance of the SI leaders forming and cooperating as a leader group was emphasised at this meeting. A representative from the administration took part in the last part of the meeting. The SI leaders thus established a dialogue with the administration representative, and discussed how they could market SI, book rooms, etc. The students then drew up a plan for the SI work in autumn 2017, which was approved by the lecturer (teacher) and SI supervisor, and the budget was approved by the university's management. The plan was published on an intranet page after it was approved. The SI leaders are responsible for marketing the SI programme through social media and posters, etc. Joining the lecturer at a class session and presenting the SI programme to the first-year students is an important element of the marketing.

3.3 SI Session Period

The SI session period in the physics course is from September to November. SI sessions were held on Tuesdays and Thursdays from 15.00 to 17.00 and from 17.00 to 19.00 every week for four SI groups. The availability of students and the capacity of the SI programme served as the basis for determining the number of SI groups and the times of the sessions. If all 100 students took advantage of the weekly SI sessions, and were evenly distributed between the four SI groups, there would be 25 students at each of the SI sessions. An average of 10–11 students took part in the SI sessions.

4. Method and Data Collection

My day-to-day work is at Nord University Business School, Road Traffic Division, and I have trained as an SI supervisor at the European Centre for SI-PASS Lund University. I have coordinated the introduction of SI in Norway, co-organised the SI supervisor course in Norway, and practised as an SI supervisor at Nord University since 2017 in collaboration with the European Centre for SI-PASS at Lund University. My role as author of this chapter is based on my role as researcher.

4.1 Hermeneutic Phenomenological Methodology

Qualitative methods take advantage of different strategies for collecting data, but are largely based on theory of human experience (phenomenology) and interpretation (hermeneutics) (Malterud, 2003). Phenomenology focuses on descriptions of people's experiences (Kvale, [1997] 2007; Bengtsson, 1999). Hermeneutics is described as the study of text interpretation, and processing and interpreting text is a part of the research process in qualitative studies (Lindseth & Norberg, 2004).

I have taken a hermeneutic phenomenological approach in my research. The intention of a hermeneutic phenomenological study is to describe the reality, interpret the description, and understand what the reality is all about. A hermeneutic phenomenological practice addresses how narratives from practice can be interpreted and structured, to ensure that the most important elements in the narratives are highlighted and made clear (Lindseth & Norberg, 2004). Selecting a hermeneutic phenomenological approach makes the description of the SI leaders' experiences and perceptions of their own role pivotal (Creswell, 2007). Knowledge about the SI leaders' experiences is important to following up and understanding what happens in practice. If we do not have knowledge and an understanding of the SI leaders' interpretations and perceptions of their own experiences, we will not have a well-founded understanding of their practice (Helde & Suzen, 2019, p. 72).

It is common in phenomenological methodology to first present some literature in the concluding discussion section, as the researcher cannot predict the relevance of the literature before the findings are presented (i.e. topics that emerged during the process that were not expected; see Smith, Flowers, & Larkin, 2009, p. 113).

4.2 Data Collection

The present study is based on a secondary analysis of qualitative data from an earlier study among SI leaders, on the topic of the SI leaders' experiences and understanding of SI as an educational tool and SI as a leadership development programme (Helde & Suzen, 2019).

The data comprise 14 semi-structured interviews, two questionnaires, and observations made among seven SI leaders. The SI leaders completed the questionnaire after finishing their SI leader training (June 2017) and after the conclusion of the SI

programme (November 2017). Interviews were conducted before the start-up of the SI programme (August 2017) and after its conclusion (November 2017). Observations of SI sessions were made during the practical training in the programme (May 2017) and during the SI programme (September and October 2017).

An observation form was used during observations of the SI sessions. Notes from the observations were used as a basis for developing the interview guide and questionnaire. I initially conducted a thematic analysis that involved shortening the interview respondents' statements into shorter formulations, which can be described as condensing the meaning (Kvale, [1997] 2007). I then grouped the statements into overriding topics. This formed the basis for preparing a description of what the participants had experienced (Smith, Flowers, & Larkin, 2009). In phenomenological methodology, the results can be structured to either follow the person or the topics (Smith, Flowers, & Larkin, 2009, p. 113). I have chosen to present the results from the SI leaders thematically. I illustrate and support this using quotes from the interviews, and the results from the questionnaires and observations. All of the data were anonymised, and I use numbers instead of the SI leaders' names in the text.

The seven SI leaders were women and men of different ages with different education and work experiences. One SI leader had leadership experience from the private business sector, one had taken a leadership programme and had leadership experience from the army, one had taken a coaching course, and one had experience teaching. Not all of the SI leaders had attended SI sessions themselves. Some had positive experiences of participating in SI, while others had chosen not to take it. Most of the SI leaders stated that, as students, they had found the course in physics difficult in the beginning, and they therefore recognised the importance of providing help in the course. The SI leaders also emphasised that physics is a subject that requires academic maturity, which has to be developed over time.

In my study, I have examined the SI leaders' personal experiences and present my findings in the next section.

5. Results

The SI leaders expected their role to help them learn leadership skills and develop as leaders:

> It will make me a better leader, and help me to be more confident in front of large groups. . . . I expect that I will have to spend some time working on planning sessions, and that I will have to be structured so that the students taking SI find it useful. . . . I also expect to become a better leader and guide. (Questionnaire 1, June 2017)

After the period of SI sessions concluded, all SI leaders responded that they had found the work 'very rewarding' (e.g. Questionnaire 2, November 2017).

The SI leaders' experience of and understanding that the SI programme contributes to learning leadership and leadership development is presented thematically. I use active verbs to divide the findings into three categories:

- learning leadership,
- understanding the SI leader role, and
- applying SI and the course material as a 'tool' for learning leadership and leadership development.

5.1 Learning Leadership

The SI leaders emphasise that the lectures given by the SI supervisor before and between the tasks in the SI leader course were a source of learning.

> I think it was great to get training. There were a lot of things I didn't fully realise, such as how an SI group was to be led. I thought we were going to teach, but I learned during the course that we were going to serve more as supporters and help the students to find answers themselves. (Questionnaire 1, June 2017)

The SI leaders appreciated the short lectures before tasks and the role play.

> Informative, a lot of useful information, brought up unseen aspects. . . . Good, brief and precise. (Questionnaire 1, June 2017)

The SI leaders learned a lot from taking on different roles in the role play during the SI leader course.

> I thought that the role play we did worked really well. I would say that I remember more from the role play than from what I have read about SI. (Questionnaire 1, June 2017)

> Fun and educational. Nice to try the role yourself, although it is a slightly artificial situation. (Questionnaire 1, June 2017)

The SI leaders emphasise the importance of feeling confident in the role of SI leader during the practical training.

> It has been really good to be able to start the SI sessions with people you already know. This has enabled us to focus more on the SI method than I think would have been the case if we had been thrown in at the deep end with a much bigger group of people we didn't know. (Questionnaire 1, June 2017)

After the period of practical training, SI leader 2 said the following about how you could learn more about leadership during the SI session period:

> Maybe take part in one of the other SI group's sessions. Not every time, but sometimes to see what the others are doing. I didn't. I maybe should have in order to have learned more. (SI leader 2, interview 1)

SI leader 7 referred to the advantages of observing other SI leaders in the following way:

> You watch what they're doing – there's no discussion afterwards, you just pick up a few things subconsciously, or consciously! (SI leader 7, interview 2)

SI leader 7 also pointed out that working in pairs with different SI leaders makes for a close-knit leader group, which contributes to individual learning:

> Yes, and if we all take a few things from each other, we will all grow. (SI leader 7, interview 2)

SI leader 2 said the following regarding learning leadership through holding the SI sessions:

> I think one of the most important things you learn by being involved in the SI programme is independence and the ability to take things in your stride. (SI leader 2, interview 1)

The SI leaders said the following about preparing ahead of SI sessions:

> I think the biggest challenge at this point is that it's difficult to set a fixed agenda. (SI leader 3, interview 1)

> It's generally gone well, but there's no question that the times that have gone best have been when time has been set aside to prepare the sessions in advance. (Questionnaire 2, November 2017)

In relation to the question of how the SI leaders best learn to lead, SI leader 2 responded as follows:

> I know how I learn best. I learn best by master–apprentice learning. It enables me to learn best by watching what others do and then doing it myself afterwards. I reflect then on how I'm going to do it. Next, I learn best by learning theory, before practice. This gives me some theoretical direction for how I should conduct myself. (SI leader 2, interview 1)

SI leader 2 points out after having led SI sessions that:

> I learn by subsequently reflecting on this experience. I learn practical subjects more easily than theoretical subjects, although I am perhaps a theorist. (SI leader 2, interview 1)

In response to the question of whether it is important that SI sessions turn out as planned, SI leader 1 says:

> It's not important that they turn out as planned. Because if we plan to bring up something, it may be something completely different than the topic the students want to bring up. And then it's better to discuss what they want to bring up, rather than what we want to bring up. Because they're the ones who are supposed to learn. . . . What is important is that those who are supposed to learn something actually do so. That they learn what they want to learn, not what we want to teach them. (SI leader 1, interview 1)

After reflecting on what has been learned and experienced after the SI leader course and practical training period, SI leader 3 stated:

> Yes, it's important to make some plans for what we are going to go through. That we have a kind of agenda, we want to get through the material. But then the group can suddenly turn out to have a different starting point than you expect them to have. So then you also have to plan to play it by ear, if you know what I mean. That you adapt more closely to what meets you when you start. (SI leader 3, interview 1)

The SI leaders were asked about whether leading SI sessions helped the individual SI leader to develop.

> We have had some training in asking the right questions to get people to think. . . . I think that this has given me a more educational approach to my own education. (Questionnaire 2, November 2017)

The SI leaders want to work together in pairs.

> There have been two SI leaders at the SI sessions. I think that has been a huge advantage. I think both the planning and sessions themselves have been more effective as a result of there being two of us. I also think it would be a good idea if there is more than one SI leader at the SI sessions when the SI group expands significantly next year. (Questionnaire 1, June 2017)

> I personally would now prefer to hold SI sessions together with at least one other person, as the other person may have different opinions to me, and can help me out if I get stuck. The level of knowledge in the group may also differ widely, and then it's easier to follow up the students when there's two of you. (Questionnaire 1, June 2017)

In relation to whether and how often SI leaders who work together give each other feedback, SI leader 3 says:

> Yes, we do. We often talk about how it's going. And that's how it was with the SI leader I worked with at the most recent SI session; we talked a couple of days after the session too. (SI leader 3, interview 2)

SI leaders would like even more communication, which is reflected in one proposed improvement:

> Better cooperation between the SI leaders, more communication. (Questionnaire 2, November 2017)

The SI leaders believe the feedback from the SI supervisor is important at the start of the SI programme, but, as they work in pairs, this is not as necessary after they have led a few SI sessions. The SI leaders said the following in this context:

> Maybe a little more closely initially, but with a freer rein at the end. (SI leader 3, interview 1)

> I think it's good that the SI supervisor is available, that we can ask about anything we are wondering about, so that's very good. I don't think that we need follow-up all the time. Because we've had a go during the practical training, and we got feedback before summer and we had some discussions before we started holding the SI sessions. (SI leader 7, interview 2)

All of the SI leaders say that they are happy for the SI programme to include observation and feedback from the SI supervisor.

> Now we know that this is being done properly, and probably get a lot more out of this programme as SI leaders when it includes proper follow-up. Other than just helping people with their school work, I mean. (SI leader 5, interview 1)

The SI leaders find that everyone benefits from attending SI, and that there is learning to be gained by everyone, both SI leaders and SI participants (students):

> Those who are guided learn something and increase their understanding, but those who guide end up in full control. . . . [T]hose who guide learn most. (SI leader 2, interview 2)

5.2 Understanding the Role of SI Leader

One SI leader offered the following statement about their expectations of SI and the role of the SI leader:

> I expect SI to be a social anchor for those learning a subject that requires academic maturity. Because understanding the importance of a head start is not perhaps associated with knowledge, but with feelings, somehow. So the fact that they are participating is not necessarily about their wish to excel in the subject, but more a social anchor where you want to go somewhere with others and do something you think is important and enjoyable. I think that's what I expect – that we are a group that has fun and does important things. That they get a chance to have a go six months before they sit the exam. (SI leader 7, interview 1)

The SI leaders refer to the importance of understanding what the SI leader role entails at an early stage.

> I think it's great that we underwent a short course. I believe that most of us were prepared to teach physics, but the course taught us how we should actually lead an SI group. To help the students to find the answers themselves. (Questionnaire 1, June 2017)

> The core SI training, that dealt with the mandate and clarification of roles, was really good. (SI leader 2, interview 1).

The SI leaders try to stay up-to-date with the subject before the SI sessions start, but do not deem this a precondition for a successful session. SI leader 1 states the following:

> If you start with something you don't feel 100% confident about, it might be a bit difficult. But most of the physics was ok, so I thought it went fine actually. They [the students] are learning something they want to learn, and we do our best to help them. But sometimes there were a few tasks where we SI leaders weren't entirely sure of the answers ourselves, like difficult exam questions. But you always manage to work your way through it. And if we can't do it, it doesn't really matter, they're the ones who are supposed to be doing it anyway. (SI leader 1, interview 1)

All of the SI leaders have positive experiences of there being two of them at each session, because it means they always have someone to lean on if they are in doubt about any issues.

It is not important to the SI leaders to have clear rules, etc., for the SI sessions, since their main aim is for the participants to get something out of the sessions. SI leader 2 states:

> It's really about including everyone, and those who are best at SI can help those who aren't quite as good. (SI leader 2, interview 1)

To do well in the SI role, the SI leaders believe they should be good at the subject, sociable, and inclusive.

> The SI leaders should know what they're doing and get everybody on board . . . and that the students feel that they can ask. (SI leader 6, interview 2)

> If they [the students] are not on the right track, and you [as SI leader] are not aware of this, you won't be able to do much about it. And if the students are not on the right track, you must be able to lead them back onto the right track. (SI leader 2, interview 2)

The SI leaders also emphasise that confidence is important for doing well in the SI leader role.

> I dreaded it a bit, thought it would be really scary to stand in front of them. . . . It wasn't as scary as I had imagined. You don't get better at something without giving it a go. (SI leader 6, interview 1)

5.3 Applying SI and the Course Material as a 'Tool' for Learning Leadership and Leadership Development

The SI leaders highlight the importance of having a 'Handbook for SI leaders' when it comes to learning leadership on the SI leader course.

> Good. Review of the most important aspects of the book. Focus on group dynamiques. (Questionnaire 1, June 2017)

The SI leaders have also experienced that the course material can be applied throughout the SI programme.

> The book is a great thing to have. I wish it was in Norwegian, but that's not a big problem. I think it's good to have if there's anything I'm wondering about in relation to being an SI leader. (Questionnaire 1, June 2017)

The SI leaders perceive SI, with the course material, lectures and self-study, as a programme for learning leadership. As SI leader 4 states:

> I have full confidence in this programme, definitely. If I didn't, I wouldn't have registered as a leader. (SI leader 4, interview 1)

The SI leaders were asked whether they felt they had developed as leaders during the SI programme. Most answered that they had developed as leaders to a great extent, while one SI leader felt they had only developed as a leader to a lesser extent.

Those who felt that they had developed as leaders explained this through statements, such as:

> Better administrative skills, classroom teaching has become easier. . . . I've improved at asking the right questions. I'm more comfortable standing in front of a group of people. (Questionnaire 2, November 2017)

The SI leader who had developed as a leader to a lesser extent explained this through the following statement:

> I have previous education where the SI leader role is an element that falls under the same category as guidance and coaching. (Questionnaire 2, November 2017)

6. Discussion

I now answer the three questions I posed in the introduction to this chapter.

6.1 How have the SI Leaders Learnt Leadership in the SI Programme?

The SI leaders find that the SI programme, in different ways, enables them to learn leadership skills and develop as leaders. Berg (2000) points out that learning leadership and leadership development can take place by means of transfer, observation, doing, reflection, and learning through feedback. Learning leadership by means of transfer mainly took place in the SI leader course. The SI leaders highlighted that the short lectures given by the SI supervisor before and between the tasks on the SI leader course were a source of learning. Passive intellectual learning can be important for establishing an overview of a topic. The SI leaders thus gain an understanding of the most important terms, models, and theories relating to the SI method before they start practising as SI leaders themselves. Learning leadership through observation takes place during role play and by observing how other SI leaders hold SI sessions. The SI leaders expressed that they learned a lot from taking on different roles in the role play. They also emphasised that cooperating with different SI leaders makes for a close-knit leader group, which contributes to individual learning.

The SI leaders emphasise that learning and leadership development takes place through trial and error in connection with the SI sessions. It may in this context be expedient to distinguish between SI leaders' strategic leadership and situational leadership. With respect to strategic leadership, the SI leaders highlighted the importance of being up-to-date with the subject and investing time in planning SI sessions. They also believed that it does not really matter if SI sessions do not turn out as planned, but that the most important thing is that the students learn what they want to learn. The SI leaders referred to situational leadership as being open to the unforeseen, and they highlighted that this makes them independent and that they develop 'the ability to take things in their stride'. A positive and supportive relationship with each student is very important for the students' learning outcomes (Marzano, 2009). The SI leaders believed that the biggest challenge in connection with holding the SI sessions is the difficulty of setting a fixed agenda for the sessions.

The SI programme uses special SI forms to enable the leaders to think through the experiences they have had. The SI leaders pointed out that they learned a lot by reflecting on their own experiences. An SI leader can reflect on 'different levels', for example, through self-reflection, together with the other SI leader, the SI leader group, or the SI supervisor. SI leaders must be willing to analyse and evaluate their own preparations and leadership of sessions, which leads to a twofold educational challenge where reflection on practice is essential (Schön, 1983). Learning leadership also takes place through feedback, and confrontational learning is a method that can contribute to leadership development for the SI leaders throughout the programme. The SI leaders pointed out that working in pairs and alternating between the SI leaders you cooper-

ate with is an advantage. The SI leader group thus developed an open and direct learning environment, enabling the SI leaders to give each other feedback after the sessions.

The SI programme is also organised such that the SI leader receives feedback from the SI supervisor who observes the SI sessions (Lund University, 2017b). All of the SI leaders said that they are happy for the SI programme to include observation and feedback from the SI supervisor. During the period in which SI sessions are held, the SI supervisor holds supervision meetings with the individual SI leaders or with the SI leader group. The supervisor should also regularly observe SI sessions. Special SI observation forms can be used during observation. This observation forms the basis for subsequent discussions with the SI leader. The dialogue with the SI supervisor is important for SI leaders' learning, and the SI supervisor can give a formative assessment of the SI leader's activities at SI sessions. Formative assessments are intended to promote development and improvement in an ongoing activity (Scriven, 1967). In their research, Black and William (2009) refer to three key principles of formative assessment: feedback, feed up, and feed forward. The SI supervisor can provide feedback on how the SI leader handles situations at the SI session, feed up in relation to the SI method, and feed forward in relation to the SI leader's further development. The SI leaders believed the follow-up from the SI supervisor is important at the start of the SI programme, but, as they work in pairs, it is not as necessary after they have led a few SI sessions.

6.2 How have the SI Leaders Understood the SI Leader Role?

The SI leaders referred to the importance of understanding what the SI leader role entails at an early stage. They made it clear that the clarification of roles at the SI leader course was important for their understanding of their role. One SI leader said that they learned how to lead an SI group in the course and to help students find answers themselves. The SI leader is only meant to serve as a facilitator of learning activities and to help students in the learning process. The SI leaders also saw it as their role to include all the participants, to enable everyone to benefit from taking part in the SI sessions. SI should thus contribute to realising a key educational paradox:

- How should SI leaders lead the students to lead themselves?
- How should the student contribute through participation to their own development?

Being able to lead oneself in the longer term is only possible through an external influence (von Ottingen, 2003). The leadership of SI sessions will thus entail an asymmetrical relationship between the SI leader and students where the students are brought on board and assigned responsibility. This is not an equal relationship, but it should be balanced. The SI leader must exercise a form of authority or certain control, and, at the same time, be supportive, appreciative, and close to the individual student. Helde and Suzen (2019) highlight three dimensions of authority. Professional authority is the

academic skill that the SI leader possesses. The SI leaders highlight being up-to-date and prepared as an important part of the SI leader role. The SI leaders express that professional authority is linked to the strategic leadership they exercise in advance. The personal authority of each SI leader is important for individual students to be able to trust the SI leader. It is important for SI leaders to be confident in their own role and with respect to creating a sense of security in the SI group, so that the students feel confident contributing to discussions. The SI leader role automatically gives the leaders a type of institutional authority, but this is not necessarily strong. The term SI leader expresses a role and a position that involves responsibility and leadership. The SI leaders believe that the most important thing is how the role is filled and exercised by the individual. As SI leader 2 states: 'It's really about including everyone, and those who are best at SI can help those who aren't quite as good' (interview 1).

Many good arenas have been created in the SI programme for SI leaders to develop in their role, and to reflect on and exercise their own authority. Awareness of this role is a precondition for creating learning that contributes to leadership development for the SI leaders. This development takes place by discussing the understanding of roles, together with other SI leaders or the SI supervisor.

6.3 How have the SI Leaders Understood and Experienced that the SI Programme Contributes to Leadership Development?

For the SI leaders, participating in an SI programme shares many similarities with participating in a leadership development programme (Lund University, 2017a, 2017b). The SI leaders must complete a two-day course before they can lead SI sessions. An SI leader group is established at the course. The SI leaders have highlighted in many contexts that they believe that working together with another SI leader at the SI sessions is an advantage.

The SI leaders highlighted the importance of the course material with respect to understanding the SI leader role and to learning leadership and leadership development through the SI programme. The course material from Lund University (2017a, 2017b) includes observation forms that the SI supervisor or SI leaders can use during observation of SI sessions. The observation form is used to learn more about leadership, and, together with SI leaders' own reflections, form a basis for conversations between SI leaders and with the SI supervisor. The SI leaders believe that the dialogue with the SI supervisor provides useful guidance, particularly during the SI programme's opening phase. Learning leadership requires time to be set aside for reflection and feedback, and the SI leaders believed that the SI programme and course material are good tools for learning leadership and leadership development. This promotes the SI leaders' continuous learning throughout the SI programme, and the SI leaders are perceived as reflective leaders – or as Schön (1983) calls them, reflective practitioners.

After the end of the SI programme, most of the SI leaders responded that they had developed as leaders to a great extent. The SI leaders emphasised that they had developed better administrative skills, become better teachers, improved at asking

questions that engaged the students, and become more comfortable leading group processes. One SI leader who had previously taken a guidance and coaching course had developed as a leader to a lesser extent.

7. Implications and Further Research

This chapter has focused on SI leaders' understanding and experience of learning leadership and leadership development in the role of SI leader at the university. The SI leaders also believed that what they learned about leadership in the SI programme may prove useful in their subsequent careers. 'I believe that my SI leadership experience can give me a better foundation for a range of jobs' (Questionnaire 2, November 2017). One relevant topic would be to investigate how previous SI leaders have applied these experiences in their own professional practice.

This study only deals with seven SI leaders in the Driving Instructor Education Programme. Including other fields would be beneficial to gain knowledge of how the SI leaders at other faculties and universities experience the SI programme's contribution to learning leadership and leadership development.

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4 Enhancing Employability Skills Through Being an SI-PASS Leader

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Abstract: The present study focuses on the potential benefits of the SI-PASS experience for former leaders in their professional life after graduating from higher education. This topic has received little attention, with the few studies being limited by the small number of participants and the approaches used and questions asked. The present survey was sent to 279 former SI-PASS leaders who graduated from the School of Engineering at Lund University, Sweden, during the period 2010–2019. A total of 91 (33%) responded. The results show that the main qualities developed through SI-PASS leadership are leadership confidence and facilitation and presentation skills. These are qualities that are appreciated by many former leaders in their professional life. Almost all of the respondents report that they have had at least a little use of SI-PASS trained qualities in their job, and half report good to very good use. More than 80% of the respondents believe that being an SI-PASS leader helped them in getting hired for a job, at least to some extent.

1. Introduction

Supplemental Instruction/Peer-Assisted Study Scheme (SI-PASS) is a peer learning programme developed with the aim of increasing student learning, performance, and retention (Arendale, 1994; Blanc, DeBuhr, & Martin, 1983). An additional benefit is that the senior students acting as leaders and facilitators during SI-PASS sessions train and develop several leadership and group management skills. Surveys, interviews, and focus groups have yielded self-reported improvements on several of these, such as:

- Presentation skills/talking in front of others (Tran, Hartmann, Cadwallader Olsker, & Bonsangue, 2016; Zaritsky & Toce, 2006; Scott, McLean, & Golding, 2019).
- Listening skills (Congos & Stout, 2003; Tran, Hartmann, Cadwallader Olsker, & Bonsangue, 2016; Chilvers & Waghorne, 2018).
- Organisational and planning skills (Congos & Stout, 2003; Gill & McConnell, 2016; Malm, Mörner, & Bryngfors, 2012).
- Group management/teamwork (Capstick, 2004; Lozada & Turner Johnson, 2018; Stout & McDaniel, 2006).
- Facilitation skills (McIntosh, 2017; Skalicky & Caney, 2010; Chilvers & Waghorne, 2018).
- Flexibility/adaptability/improvisation skills (Couchman, 2009; Ford, Thackeray, Barnes, & Hendrickx, 2015; Laurs, 2018).
- Patience (Congos & Stout, 2003; Lozada & Turner Johnson, 2018; Podolsky, 2017).

- Leadership confidence (Capstick, 2004; Eller & Milacci, 2017; McPhail, Vuk Despotovic, & Fisher, 2012).
- Reflective practice/critical thinking (Couchman, 2009; Laurs, 2018; Carr, Evans-Locke, Abu-Saif, Boucher, & Douglas, 2018).
- Time management skills (Eller & Milacci, 2017; Lozada, 2017; Skipper & Keup, 2017).
- Creativity (Ford, Thackeray, Barnes, & Hendrickx, 2015; McIntosh, 2017; Zacharopoulou, Giles, & Condell, 2015).
- Problem solving (McIntosh, 2017; Podolsky, 2017; Zacharopoulou, Giles, & Condell, 2015).
- Motivating others (Lockie & Van Lanen, 2008; Malm, Mörner, & Bryngfors, 2012; Zacharopoulou, Giles, & Condell, 2015).

Are these self-reported benefits that SI-PASS leaders experience also something that benefits them after graduating from higher education? This question has received relatively little attention. The few studies conducted indicate that that this is the case (e.g. Congos & Stout, 2003; Podolsky, 2017; Chilvers & Waghorne, 2018). Specifically, when applying for a job, the merit of being an SI-PASS leader makes them stand out from other applicants, thus increasing their chances of getting the job (Chilvers & Waghorne, 2018; Lozada & Turner Johnson, 2018; Malm, Mörner, & Bryngfors, 2012). Furthermore, in their job, many former SI-PASS leaders express that they often use skills developed in their former leadership role (Podolsky, 2017; Chilvers & Waghorne, 2018; Malm, Mörner, & Bryngfors, 2012). These studies on post-graduation benefits for SI-PASS leaders have involved relatively small groups of former SI-PASS leaders, which means the results may not be reflective of former SI-PASS leaders in general. Therefore, one of the aims of the present study was to reach a larger number of former SI-PASS leaders. The research questions were:

- Which of the skills trained and developed through the SI-PASS leadership programme are seen as most significant in hindsight?
- Which of the skills are most commonly used in professional life after graduation?
- To what extent can earlier observations be confirmed that the merit of being an SI-PASS leader is seen as an advantage when applying for a job?
- In professional life, how much use have the former SI-PASS leaders made of the qualities they developed in their former SI-PASS role?

2. Method

To answer the research questions, an online survey was created (see the Appendix). The survey consists of a mix of questions with multiple choice answers (yielding quantitative data) and open-ended questions (qualitative data). The quantitative data were summarized in tables that display the percentage of respondents for each multiple-choice answer. The qualitative data from responses to questions 3 and 9 (see Ap-

pendix) were processed using thematic analysis. The themes used were the leadership and group management skills relevant for SI leaders that are listed in the Introduction above. The free-text responses were then compared with these themes. The percentage of responses agreeing with each theme was then calculated. One relevant theme emerged in the responses to question 9 besides those listed in the introduction – empowering others. The free-text responses to questions 6, 10, and 11 were analysed with respect to typical ways that experiences from being an SI leader could influence getting hired or be used in professional or other aspects of life.

The link to the survey was sent by mail and/or e-mail to 278 former SI-PASS leaders who graduated from the School of Engineering at Lund University, Sweden, during the period 2010–2019. A total of 91 people responded to the survey (~33%).

3. Results

The respondents had, on average, three semesters of SI-PASS leader experience. The first question about the influence of the SI-PASS programme related to the impact on their undergraduate studies (see Table 1). Almost 9 out of 10 respondents indicated that the SI-PASS experience had at least a small impact on their undergraduate experience. More than 60% believed that the impact was at least moderate. Thus, it seems that being an SI-PASS leader enriched the student experience to at least some extent for an overwhelming majority.

Tab. 1: Responses to the question, 'Was your undergraduate academic experience influenced by your experience as an SI-PASS Leader?' *(N = 91)*

I don't know	Not at all	A little bit	Moderately	Very much
4%	9%	24%	44%	19%

The free-text answers to the question, 'In hindsight, what are the most significant abilities, values, or skills that you developed as an SI-PASS leader?', were analysed using theme analysis. The results are given in Table 2. As seen in the table, there were three qualities trained or developed by being an SI-PASS leader that stood out: leadership confidence, and facilitation and presentation skills. Since facilitation and communication are core in leading SI sessions, the results are not surprising. Furthermore, it is natural that leadership confidence increases with practice. Confidence and presentation skills were also among the enhanced qualities found in other studies (Chilvers & Waghorne, 2018; Congos & Stout, 2003; Lozada & Turner Johnson, 2018). Facilitation as an enhanced skill was also found by Chilvers and Waghorne (2018) to be important, while not being clearly identified by the others. Thus, there seems to be agreement between studies with respect to some of the developed qualities. But a fair comparison between studies is hard to make, due to the fact that the questions were formulated differently, which perhaps invites different kinds of responses. The fact that some questions in the other studies were closed-ended presumably has an impact as well.

Tab. 2: Theme analysis on the free-text answers to the question, 'In hindsight, what are the most significant abilities, values, or skills that you developed as an SI-PASS Leader?' In the table, the percentage of responses to the most significant skills trained and developed through SI-PASS are given relative to the 87 responses. Only skills present in more than 10% of responses are included.

Most significant abilities, values, or skills trained and developed through SI-PASS	Percentage of responses
Leadership confidence	45%
Facilitation	37%
Presentation skills/talk in front of others	17%

The fact that the majority of the respondents did not consider the SI-PASS experience as having any influence on their choice of job or graduate studies is hardly surprising (see Table 3), considering that the SI-PASS experience is a very small part of their overall student experience. It is, however, surprising that more than a quarter of the respondents felt that their SI-PASS experience had a moderate to high impact on their choice of job or graduate studies. This indicates that the SI-PASS experience can be transformative and help students find a new professional path that is better suited for them.

Tab. 3: Responses to the question, 'Did your experience as an SI-PASS Leader influence your choice of job or graduate studies?' *(N = 91)*

I don't know	Not at all	A little bit	Moderately	Very much
4%	53%	18%	18%	8%

More than 80% of the respondents believed that being an SI-PASS leader helped them in getting hired for a job, at least to some extent (see Table 4). Free-text answers to the question, 'How did the SI-PASS leader experience positively influence the ability of obtaining employment after graduation (if answer was yes)?', follow different themes. The 13 respondents who started a PhD (considered an employee in Sweden) often point out the value of being in a pedagogic position as an SI-PASS leader. Several respondents stressed that the leadership and group management experience in SI-PASS was seen as positive by their employer. Others mentioned they believed that the merit stood out, especially the responsibility and social skills required in the role.

Tab. 4: Responses to the question, 'Do you believe that being an SI-PASS Leader positively influenced your ability to obtain employment (get hired) after graduation?' *(N = 91)*

I don't know	No, not at all	Yes, a little bit	Yes, moderately	Yes, very much
5%	14%	41%	23%	16%

Aside from the 13 PhD students, the jobs the respondents obtained after graduation were varied. Most were in different engineering (software, environment, automation, construction, product development, etc.) and consultant roles. Eighteen respondents mentioned that they had some sort of leadership position, such as a project manager.

Half of the respondents have made good or very good use of the qualities trained and developed while an SI-PASS leader (see Table 5). A very clear majority of the remaining respondents have had at least a little use of these qualities. Thus, it can be concluded that the SI-PASS experience is beneficial in professional life for an overwhelming majority of the respondents, and that it gives them an advantage compared to many other higher-education graduates. The main qualities developed as an SI-PASS leader used in professional life (see Table 6) echo the most significant qualities developed (see Table 2). Facilitation, leadership skills, and presentation skills are once more the clear top three. However, qualities like empowering others, listening skills, and planning, organisation, and time management are also valued in their job, but to a lesser extent.

Tab. 5: Responses to the question, 'In your occupation(s), how much use have you had of the qualities developed as an SI-PASS Leader?' *(N = 90)*

I don't know	Not at all	Very little use	Some Use	Good Use	Very good use
2%	2%	19%	27%	37%	13%

Tab. 6: Theme analysis of the free-text answers to the question, 'Which skills that you developed as an SI-PASS Leader have you used in your occupation(s), if any?' The percentage of responses to the most significant skills trained and developed through SI-PASS are given relative to the 73 responses. Only skills present in more than 10% of responses are included.

Most significant abilities, values, or skills trained and developed through SI-PASS	Percentage of responses
Facilitation	46%
Leadership confidence	35%
Presentation skills/talk in front of others	35%
Empowering others	13%
Listening skills	11%
Planning, organisation, and *time management*	11%

The survey respondents were prompted to give an example of and describe a situation where they used the experiences of their SI-PASS leadership in their professional life (question 10 in the Appendix). Below are a few examples of responses illustrating typical ways the SI experiences could benefit the former leaders in professional life:

- 'Leading a group of consultants. They don't have each other's skills and I don't have theirs, so it's a lot like leading a SI-PASS group'.
- 'Talking in front of a crowd. Being project executive and describing how parts fit together to make a bigger whole'.
- 'Meetings. Listen to other people's points of view to understand them and their goals better'.
- 'Scrum meeting for the next two weeks where we went through issues that needed to be solved. Having open discussions about many outcomes and possibilities for solving the issues before deadline'.
- 'In situations where I have put myself in a situation I'm not totally confident in, but doing it anyways'.
- 'When conducting workshops and trainings for customers'.

Thus, one can conclude that the experiences from the SI-PASS leadership programme can potentially be beneficial in a multitude of ways in jobs after graduating from higher education.

There were only 23 responses to the question, 'Have you used the skills you developed as a SI-PASS leader in other aspects of your life (volunteering, relationships, etc.)? If so, how?' Some of the responses reveal that skills from the SI-PASS experience have been used in family relations – with raising children and in marriage, as specific examples – and in leadership positions outside of work. Other responses are more varied and reveal that the qualities trained and developed may be used in a multitude of ways. A few examples are presented here:

- 'A better understanding for how people can think differently'.
- 'I used to suffer from social anxiety, so I signed up to be an SI leader for two reasons – one is because I enjoy the subject I had the meetings for, and two was to help me get over my social anxiety through exposure. It worked wonders for me'.
- 'If I disagree with someone in a discussion, I often do not stubbornly claim that I'm right, but rather try to humbly ask questions which I expect will lead the other person to my point, making the other person find the problems with their own standpoint'.

4. Discussion and Conclusions

If we return to the research questions of the study formulated in the Introduction, we can now determine whether or not they have been answered. The first question, 'which of the skills trained and developed through the SI-PASS Leadership are seen as most significant in hindsight?', yields three main qualities: leadership confidence, and facilitation and presentation skills. These are also the qualities most commonly used in professional life after graduation. The main reported qualities may be influenced by the type of jobs that engineering students obtain after graduation, but the skills themselves are not specific to the field. Earlier studies agree that leadership confidence

and presentation qualities are valued by former SI-PASS leaders in their professional life. One study also reports that facilitation is an important quality in their jobs, while the others do not address this specifically. Generally, earlier studies include all skills mentioned in responses to open-ended questions, making it a bit difficult to determine each skill's importance.

Is the merit of being an SI-PASS leader seen as an advantage when applying for a job? The answer is yes, at least to some extent, for a clear majority of the respondents to the survey. If included in the CV, it is something that stands out in the eyes of an employer with respect to experiences of leadership and group management, as well as the requirements of taking responsibility and using social skills. This supports the conclusions in earlier studies (Chilvers & Waghorne, 2018; Malm, Mörner, & Bryngfors, 2012). Almost every one of the respondents has had at least some minor use of qualities trained and developed while being an SI-PASS leader in their job, with half of the respondents having good or very good use of these skills. Thus, we conclude that SI-PASS experiences benefit former leaders in their professional life. This also supports the findings of previous research (Chilvers & Waghorne, 2018; Congos & Stout, 2003; Lozada & Turner Johnson, 2018).

How are the findings above relevant to a wider context? If we, for instance, consider higher education in Sweden, about half of the higher education institutes (HEIs) have SI programmes of some sort (the sizes vary from SI programmes limited to a singular subject to those provided to most new students at the HEI). The findings above can provide additional incentives – besides helping new students to adjust to higher education or providing help in a challenging course – to establishing new SI programmes or expanding existing ones. Furthermore, if students become aware of what they gain skill-wise from being an SI leader, the position might become even more attractive. This may in turn yield an even-better-equipped group of SI leaders, thus enhancing the quality of SI at the HEI. Although the results above are for former SI leaders in engineering at one HEI, they seem to agree with earlier studies. Thus, it seems reasonable to assume similar results for leaders from other subject areas and from other HEIs. SI is relatively unknown in Swedish society (although that has started to change, especially in the south where SI is used frequently in both higher education and high school), and employers are seldom aware of SI and what the experience signifies for a former SI leader seeking employment. However, new efforts to make leaders aware of what they gain during their experience as well as providing them with a uniform work certificate describing the SI leader role may change this. Since the former leaders in this study work in different parts of Sweden (combined with the fact that former leaders graduated from HEIs all over Sweden), the awareness of SI should become more general in Swedish society with time and not just localised to a specific region.

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Appendix: SI-PASS Leader Alumni Survey

Text provided to respondents of the survey:

Through the SI-PASS Leader alumni survey we are seeking to understand the ways in which being an SI-PASS Leader may have influenced your life after university. The survey invites former graduated SI-PASS Leaders from the School of Engineering at Lund University, Sweden. Please read the following information and select 'I have read . . . and consent . . .' if you would like to continue with the survey.

I understand that my contribution will be confidential and that there will be no personal identification in the data to be used in the study. I understand that my participation in this research is voluntary and I am free to refuse to participate. If I have any enquiries about the research I can contact the responsible person for this study given below:

XXX YYY, E-mail: XXX.YYY@lth.lu.se

By selecting the checkbox below I am indicating my consent to participate in the research. I understand that the data collected from my participation could be used for journal articles, conference presentations, the national SI-PASS Center's website, and other publications as well as for advertisement and recruitment of future SI-PASS Leaders. You may skip any questions that you don't want to answer (besides the consent question).

☐ I have read the above information and consent to the responses I give in the following online survey to be used by the researchers for the purpose specified.

Survey questions:

1. How many total semesters did you serve as a SI-PASS Leader?
2. Was your undergraduate academic experience influenced by your experience as an SI-PASS Leader? (Choices: I don't know; Not at all; A little bit; Moderately; Very much)
3. In hindsight, what are the most significant abilities, values, or skills that you developed as a SI-PASS Leader?
4. Did your experience as a SI-PASS Leader influence your choice of job or graduate studies? (Choices: I don't know; Not at all; A little bit; Moderately; Very much)
5. Do you believe that being a SI-PASS Leader positively influenced your ability to obtain employment (get hired) after graduation? (Choices: I don't know; No, not at all; Yes, a little bit; Yes, moderately; Yes, very much)
6. If yes on question 5, briefly explain how.
7. What occupation(s) have you had since graduation?
8. In your occupation(s), how much use have you had of the qualities developed as a SI-PASS Leader? (Choices: I don't know; Not at all; Very little use; Some use; Good use; Very good use)
9. Which skills that you developed as a SI-PASS leader have you used in your occupation(s), if any?
10. Give an example of and describe a situation where you used the experiences of your SI-PASS leadership in your professional life.
11. Have you used the skills you developed as a SI-PASS leader in other aspects of your life (volunteering, relationships, etc.)? If so, how?
12. Other comments or remarks?

5 Supplemental Instruction Implementation in Healthcare Education

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Abstract: Within pharmacy or nursing education, the literature on the implementation and evaluation of Supplemental Instruction (SI) is limited. The objective of this study was to describe the experiences of an SI pilot in two first-year courses in pharmacy and nursing education, and to evaluate the impact of the SI model on SI leaders and students. A case study was performed on the development and structure of an SI pilot programme, and qualitative analysis was used in the evaluation. Students and SI leaders were concerned about not receiving or providing answers to questions in SI sessions, respectively. However, various helpful learning strategies were used in the sessions. The organisation of the SI programme was challenging and required continuous attention and evaluation. Positive outcomes for both students and SI leaders included improved self-confidence, socialisation, knowledge of learning strategies, and communication skills. Students were motivated to study, and SI participation was relevant to exams. SI leaders gained increased management, teamwork development, and discussion facilitation skills. We conclude that care must be taken when implementing peer-assisted learning interventions, and this study provides valuable insights into adapting SI as a pedagogical model in healthcare education. This work lays the foundation for the further development and utilisation of the SI programme in healthcare education.

1. Introduction

Withdrawal rates from higher education have been relatively high in recent decades. In Norway, approximately 50% of bachelor's degree students finished their degree within the predicted time frame in 2016. There are multiple complex causes for this trend, including external factors as well as factors related to the quality of education. Notably, student retention is affected by professional and social belonging, support services, and whether teaching and feedback engage students. The transition from high school to higher education is often difficult, and withdrawal often occurs during the first two semesters (Meld. St. 16, 2016–2017). Thus, in any study programme, it is important to implement effective tools and methods to increase retention. Maize et al. (2010) reviewed remediation programmes in pharmacy and other health professions. Generally, such study programmes have poor generalisability, and the effects of this depend on numerous factors. For example, student success is affected by preprofessional preparation, class size and diversity, motivation, teaching, and learning skills.

Supplemental instruction (SI), also known as Peer-Assisted Study Sessions (PASS), is a peer-led academic assistance programme that was originally developed to decrease the attrition rate among students, especially in medical and dental schools. The SI model was based on the notion that an introduction to study skills works best when applied to specific course content. Notably, SI involves peer learning without the direct involvement of an instructor. An important goal of SI is to have students discuss the study content, as talking requires critical thinking (Hurley & Gilbert, 2008). According to Boud, Cohen, and Sampson (2014), peer-assisted learning (PAL) involves the sharing of knowledge, ideas, and experience between students at similar or different experience and academic levels. Thus, when engaging students in PAL activities, possibilities for active student learning are created that can help students learn effectively while also learning how to learn. PAL activities should be mutually beneficial and involve the active and interactive mediation of learning (Boud, Cohen, & Sampson 2014; Aburahma & Mohamed, 2017). PAL might be of specific interest to health care students, as they require skills related to communication, collaboration, and teamwork. Students involved in PAL develop skills for organising and planning learning activities as well as evaluating their own learning. Additionally, generic skills and strategies to ensure lifelong learning (Boud, Cohen, & Sampson, 2014) and professional growth may also be features of PAL (Nelwati, Abdullah, & Chan, 2018).

PAL has demonstrated a positive impact on students' clinical skills (Carey, Chick, Kent, & Latour, 2018; Cole, Ruble, Donnelly, & Groves, 2018; Secomb, 2008) and learning outcomes (Aburahma & Mohamed, 2017; Williams & Reddy, 2016), thereby improving their patients' safety attitudes (Walpola, Fois, McLachlan, & Chen, 2015) and students' graduation rates (Malm, Bryngfors, & Fredriksson, 2018). While a variety of peer-led interventions are described in the scientific literature, these typically offer few details regarding intervention design, thereby resulting in limited possibilities for reproducing interventions and the results of their implementation. However, SI is a specific model that is both widespread (European Centre for SI-PASS, 2020) and described – at least in the manual, *The Leader's Guide to Supplemental Instruction* – in detail (The Curators of the University of Missouri, 2014). One characteristic of SI is its focus on high-risk courses, while most other PAL interventions target high-risk students. Having successfully passed the course, experienced students are specifically trained as SI leaders who can lead small study groups. The SI leaders act as role models and are not supposed to introduce new content or re-teach material (European Centre for SI-PASS, 2020; Dawson, van der Meer, Skalicky, & Cowley, 2014). Weekly SI sessions, which are voluntary to attend, are held for students to discuss specific course content. SI leaders are then observed by SI supervisors, who have nothing to do with the course content but focus on the pedagogical model. Students who attend SI achieve higher final course grades, course completion rates, and higher graduation rates than students who do not (Dawson, van der Meer, Skalicky, & Cowley, 2014; Hurley & Gilbert, 2008; Malm, Bryngfors, & Fredriksson, 2018). Further details of the SI model are provided by Hurley and Gilbert (2008).

PAL is relatively well described in the literature concerning nursing education (Nelwati, Abdullah, & Chan, 2018; Stone, Cooper, & Cant, 2013). Within pharmacy education, the documentation is relatively scarce, with methodological limitations and study findings lacking generalisability (Aburahma & Mohamed, 2017). In both study programme areas, literature concerning the experiences and effects of implementing SI is particularly lacking, especially when considering the 'strict' SI model. SI in healthcare education is of interest to improve student achievement and education completion rates. Furthermore, through facilitation by working with peer assistants, SI has the potential to engage students in course material and contribute to the development of study skills. As an educational model, SI is richly described in typical science courses (Hurley & Gilbert, 2008). Moreover, SI has also been implemented within health education – especially in anatomy and physiology courses (Bruno et al., 2016; Forester, Thomas, & McWhorter, 2004; Owens, Rainey, Tucker, & Edmunds, 2018). However, within pharmacy or nursing education, the literature on both the implementation and evaluation of SI remains limited. Furthermore, certain educational interventions might be presented as SI but ultimately fail to comply with the aforementioned characteristics of the programme (Forester, Thomas, & McWhorter, 2004; Mosley, Maize, & LaGrange, 2013). As Dawson et al. (2014) point out: *What is called SI in one circumstance is not necessarily the same intervention as SI in another circumstance*.

Thus, this work is novel in describing the implementation of SI as an educational model in pharmacy and nursing education. The aim of this chapter is to describe the experiences of an SI pilot in two first-year courses, while also evaluating the impact of the SI model on SI leaders and students. The research questions were: How can we implement SI as a pedagogical model in pharmacy and nursing education? What is the impact of SI on pharmacy and nursing students? What is the impact of SI on SI leaders?

2. Methods

2.1 Context and SI Programme Structure

The SI programme for healthcare education was developed and performed in several steps, and an overview of the development and structure is provided in Figure 1. The design of the SI implementation was initiated through faculty collaboration (Faculty of Nursing and Health Sciences and the Business School) at Nord University, Norway, during the spring of 2019. Preparation of the SI pilot included creating the project group, defining the project aims and objectives, selecting courses and programme staffing, educating four SI supervisors, defining programme evaluation and reporting, anchoring the pilot within faculty management, and ensuring financial support. The SI pilot ran in the Bachelor of Pharmacy and Bachelor of Nursing study programmes during the autumn of 2019. Two first-semester courses were selected: (1) Cell Biology and Physiology (course code FAR1004) in pharmacy, and (2) Anatomy, Physiology,

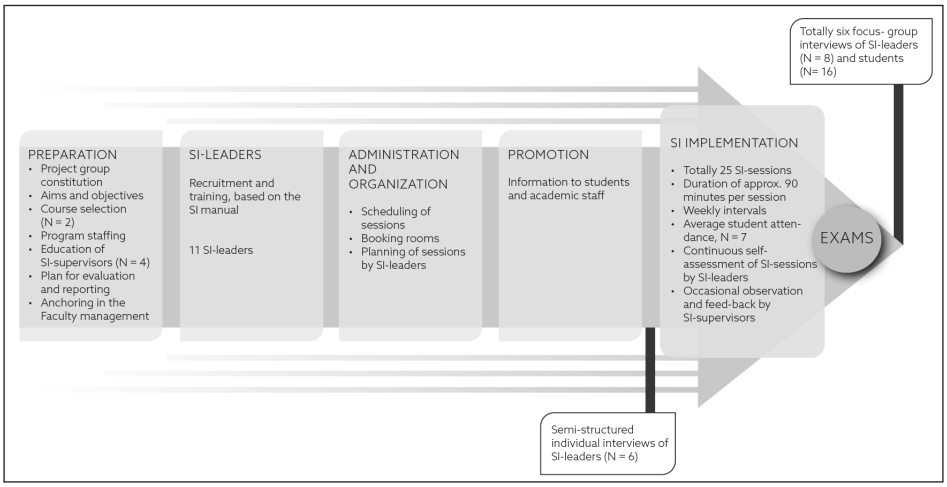

Fig. 1: Overview of the stepwise development and structure of the SI programme, including data collection for programme evaluation.

and Biochemistry (course code SYK1003) in nursing. In total, 101 students were registered for the courses.

At the beginning of the semester, SI supervisors recruited 11 SI leaders based on academic achievements and personal motivation. The SI leaders underwent a mandatory, free-of-charge two-day SI leader training course based on the European SI-PASS programme (https://www.si-pass.lu.se/en/about-si-pass/si-pass-in-europe.) The SI leaders were contracted as student assistants and received financial compensation based on the number of SI session hours they led during the semester. They were also awarded a certificate of SI leadership completion.

Academic staff involved in the pilot courses received information on the SI pilot programme through meetings with the SI supervisors. SI leaders promoted SI sessions among the students via oral presentations during a course lecture before the first session and through session announcements using dedicated Facebook groups. The faculty administration announced the SI sessions, including scheduling and room assignment, through the digital software TimeEdit.

Each week, 1.5-hour SI sessions were arranged for each course and led by two alternating SI leaders. In total, 14 and 11 SI sessions were held for the pharmacy and nursing courses, respectively. Student participation was voluntary and documented by participation logs. The number of students attending per session ranged between 1 and 21, with a mean of 7 students per session. The SI leaders continuously evaluated sessions, while SI supervisors occasionally observed SI sessions and provided feedback to the SI leaders.

The intention of the SI sessions was for students to present or introduce topics and questions concerning course content that they would like to address during the session to promote discussion. SI leaders planned and organised the sessions. They were specifically instructed not to answer questions concerning course content di-

rectly, but instead to redirect questions and facilitate discussions in the student group. However, if students did not have specific topics or questions to address, they also prepared suitable assignments for the students to work with. Additionally, while the SI leaders could contact the course coordinator/lecturer when needed, lecturers were not involved in the SI sessions. The SI leaders were observed by the SI supervisors during a few SI sessions and received supervision and feedback on their performance.

2.2 Evaluating the Programme: Data Collection and Analysis

An explorative design utilising a qualitative method was used to assess the SI pilot; all SI leaders and the pharmacy and nursing students attending SI sessions were invited to participate. Participation was voluntary, and written informed consent was provided by all participants and could be withdrawn at any time. Personal identifiable data were collected, and the assessment of personal data protection was performed and approved by the Norwegian Centre for Research Data (reference code 357756). An overview of the data collection process is included in Figure 1.

Six SI leaders (50% women) volunteered for the SI evaluation, which consisted of individual semi-structured interviews after they attended the SI leader training course but before the first SI session. Additionally, two focus group interviews with five and three SI leaders, respectively, were performed after the academic courses were completed.

First-year pharmacy and nursing students (N = 16, 81% women) participating in the two courses were interviewed via four focus groups after the courses were completed. The average age of the students was 22 years (range 19–33 years), and five of the students had previous study experience of 1–3 years.

Semi-structured interview guides were used. Interviews were recorded and subsequently transcribed. Transcribed text (46,075 words) was then analysed using qualitative content analysis (Graneheim & Lundman, 2004). The authors (HS, ALGL, ML, and LAR) participated in the analysis via an iterative reading of the transcripts and an overall discussion of the content, resulting in a consensus regarding the categories and sub-categories. Subsequently, the text was systematically analysed and coded, resulting in four main categories. The results were discussed by all authors.

3. Results

The evaluation of the SI programme pilot in pharmacy and nursing courses resulted in four main categories: answering questions concerning course content, learning strategies, organisation, and outcomes.

3.1 Answering Questions Concerning Course Content

Both SI leaders and students were concerned about not receiving or providing answers to questions concerning course content during group discussions in SI sessions. The SI leaders were focused on not giving the students direct answers to questions, but rather followed up with new questions to continue facilitating discussions between students. The SI leaders expected the issue of not answering questions to be a challenge, as expressed during interviews before the initiation of SI sessions. SI leaders also found this aspect challenging during sessions, particularly when leading the initial sessions. They wanted to give answers to confirm or praise the students, and they also sensed the students' expectations of getting answers.

> I find it difficult not to answer when people ask questions, I just want to nod or say yes or no. So, I had to work a lot on that on my own. (SI leader #4)

> It may be an important feature of being an SI leader, not to give the answers to questions. One must be equipped to restrain answers and try to get the answers from the SI session participants. That can be a challenge. (SI leader #2)

On the other hand, students expected to receive answers to their questions during SI sessions and found it difficult and frustrating when answers were not provided. As a result, they felt that the SI sessions were not helpful. Students said that this issue was most prominent during the first sessions, which influenced their further participation. However, after providing feedback to the SI leaders, students perceived an improvement, as SI leaders started to provide hints to students, pointed discussions in specific directions, and thereby helped discussions toward the path to answering questions.

> In a way, the questions were not answered. That is, we had discussed for five to ten minutes without reaching a conclusion, yet still no answer. That was the problem. You just wanted to have a simple explanation, and yet you couldn't get it. (Student #10)

> [T]here was no help going there because you did not get answers to your questions. But after we told them [the SI leaders], they became better at giving us hints and helped us on the right track. (Student #8)

3.2 Learning Strategies

SI leaders and students reflected on the varied and numerous learning strategies used during SI sessions, and how these affected them. The mentioned methods and tools included counselling, quizzes, alias (word explanation game where players explain word or phrases to each other by giving them hints and tips), physical visualisation, watching YouTube videos, using Post-it Notes, drawing, reflection, multiple-choice questions, and discussions in general, while assignments were used for colloquiums and exams. The students noted that the various learning strategies were helpful and

found that the SI leaders assisted them in achieving a better understanding of the subject. They also mentioned that the SI sessions were safe learning arenas.

> I found it very good, what we did was very diverse. Sometimes we played alias, where we tried to explain a word without saying it. We named the gastrointestinal system, drew on the blackboard, drew cells on paper sheets . . . yes, various things were discussed. (Student #11)

The SI leaders were conscious of the learning strategies they used, and discussed the methods among themselves, continuously evaluating and discussing what to do in the next session. They used many of the learning strategies introduced in the SI leader course; however, they wished that the SI leader course involved more training using such tools.

3.3 Organisation

SI leaders and students mentioned several aspects regarding the organisation of the SI programme. Overall, they expressed that the promotion of the SI programme was insufficient. Suggestions for improvements were more and repetitive information, both from SI leaders and academic staff, and the creation of incentives to participate in the sessions (e.g. exclusive SI assignments presented and promoted by the course lecturers).

> That's what should have been done a lot more, from Day 1 – repeat the information, over and over again, really. Or if you [the students] want more assignments, maybe the lecturer can provide some tasks that will only be given to the students at SI sessions. Maybe then they will show up. (SI leader #3)

In the first SI session, it is important to create a good first impression and stimulate further student attendance throughout the SI programme. The students experienced the first session as lacking structure. It largely did not meet their expectations and they believed that this could have affected further attendance by fellow students. Both students and SI leaders commented on good attendance at the first sessions, which rapidly declined thereafter.

> [T]here were many who did not return after attending the first session . . . they were present but got nothing out of it. And I can understand that because I felt the same. But if they had attended the other times as well, we would have told them it got much better. (Student #8)

The scheduling and organisation of SI sessions were perceived as challenging for the SI leaders, as there were many considerations to accommodate as well as individual opinions regarding the optimal solution. The students considered the length of SI sessions to be satisfactory; however, their opinions regarding the timing of the sessions varied in terms of both time of day and timing with course lectures. The use of

Facebook as a communication channel between SI leaders and students regarding SI sessions was mentioned as being positive. Facebook was used by SI leaders to remind students of session place and time and create polls for students to vote on session content in advance. The students used Facebook to notify SI leaders of their session attendance. The SI leaders organised the content of the sessions according to the study plan and course syllabus. They started the sessions with open questions to encourage students to describe what they wanted to discuss. If or when the discussions ebbed off, SI leaders used various learning activities that were prepared in advance to stimulate further discussions.

> A Facebook page for the SI sessions was used to post when and where they are scheduled. Some days we asked the students when it suited them to be able to predict attendance, how many will attend. For example, on our days off, we thought that there might not be any point in us being present if no one will attend. To be able to predict. And to give information . . . That's mostly what we have used Facebook for. (SI leader #3)

Overall, the collaboration between individual SI leaders, SI leaders and academic staff, the faculty administration, and SI supervisors was perceived as satisfactory by SI leaders. However, they experienced some challenges related to changes in students' schedules, which subsequently affected SI session attendance. Contact between SI leaders and course lecturers was occasional and varied greatly between individual SI leaders – some planned sessions were based on lecture notes, while others had personal contact with lecturers and specifically asked for assignments that could be used in SI sessions. SI supervisors occasionally observed SI sessions and provided feedback to the SI leaders. This was perceived as constructive and useful, and some of the SI leaders said they would have benefited from closer follow-up and more feedback.

> SI leader #2 and I had a session with one of the SI supervisors where she gave us feedback and we also told her about some concerns we had. She helped us by giving constructive criticism and at the same time solving a problem that may not have been our job to solve. (SI leader #5)

3.4 Outcomes

The SI model was well-received among SI leaders as well as pharmacy and nursing students. No negative outcomes regarding SI participation were mentioned during the interviews. The students experienced positive benefits from participating as either prepared or unprepared and gaining the self-confidence required for group discussion by daring to be insecure and asking questions. They also mentioned knowledge of learning strategies. The SI sessions gave students motivation to study and attend further sessions. The sessions were perceived as a kick-start, as students were motivated to learn the subject, gained energy from joining and considered it to be a social arena. The students perceived the learning environment in SI sessions to be safe, especially when the student groups were small. This was expressed by the fact that they

dared to ask questions and contribute to discussions despite being uncertain of their own knowledge. Group dynamics were important in this regard, and the students recognised the SI leaders as crucial since they helped the groups by, for example, including all participants in discussions and reducing the impact of dominant group members.

> Since it was a small group, it was easier to talk, to discuss – so you dare to talk as well. (Student #4)

The students planned to continue meeting after the SI programme ended and wished for SI to be arranged in other courses as well. Furthermore, the students highlighted the SI sessions as being relevant for the course exams since it was helpful to sort and focus on the syllabus. Participating in SI sessions helped during the exam.

> [D]uring the exam, I remembered that I discussed it during SI, and wrote what I remembered; thus, I felt the exam went better. (Student #7)

The outcomes mentioned by SI leaders included increased social skills among students and sessions being a social arena. Additionally, SI leaders got to repeat course content. Furthermore, they had an increased awareness of pedagogy and were also able to recognise the learning strategies used in the SI method elsewhere, thereby having prerequisites to master and fully benefit from the various strategies and methods. Overall, the SI leaders gained valuable experience as peers through improved skills, confidence, and capacity to lead discussions and manage groups of students. Moreover, they gained an enhanced awareness of their role as leaders.

> It affects our capacity to lead discussions and conversations. I have also recognised a lot from the SI method when we (as students) receive question after question instead of an answer. And that's because teachers often want us to be able to reflect on the question and the answer too. And it gives a greater understanding, and at the same time, a greater ability to do so. So, it has been very educational to get an insight into how the SI method is used. (SI leader #5)

4. Discussion

SI was introduced in healthcare education at Nord University to improve first-year student success in two high-risk courses. Guidelines for implementing SI programmes are valuable in describing generic approaches (i.e. programme staffing, selecting courses, funding, marketing, and assessment; Wilcox, 2008). However, it is important to customise the SI programme design to the specific needs of the students and the academic programme. This work is novel in describing the implementation of SI as a pedagogical model in the context of pharmacy and nursing education. The SI pilot was evaluated through reflections and perceptions from students and SI leaders, which provided valuable insights into their experiences in a healthcare education setting. Therefore, this work is of interest for academics, pedagogical researchers, pol-

icymakers, stakeholders, and others who are interested in adapting SI as a pedagogical model for practical application in general, and healthcare education in particular.

4.1 Learning Strategies in SI, Including the Answering of Questions Regarding Course Content

From both the students' and the SI leaders' perspectives, whether or not to directly answer questions was a prominent category in our results. The role of an SI leader is to ask questions, redirect questions, and help students become independent learners – not to teach students (Malm, Bryngfors, & Fredriksson, 2018). Compared to other peer-teaching programmes, this specific feature of SI will likely provide learning opportunities for students attending SI sessions as well as SI leaders (Bruno et al., 2016). During the training of SI leaders, this role as a supervisor and facilitator was thoroughly emphasised. Although SI leaders felt the urge to provide specific answers to questions, they avoided responding – especially in the first SI sessions. However, this aspect of SI was not described in the promotion of sessions to the students, nor was it thoroughly grounded in the first SI sessions. Students discovered that they were not given answers to questions, which subsequently made them question the usefulness of the sessions. Thereby, the students' expectations of SI were not met, which could lead to confusion regarding what they were supposed to do in the sessions. This likely resulted in lost opportunities for student learning (Boud, Cohen, & Sampson, 2014).

SI intends to promote students developing their own answers while learning from each other through discussions and problem solving (Helde & Suzen, 2019). To be proactive rather than reactive (Bruno et al., 2016), SI sessions need to start early in the semester. However, it seems that we must prepare both students and SI leaders for what to expect in the first SI sessions. Furthermore, adjustments to the SI leader course content may be necessary, with a need to focus on how questions can be used to support learning and start reflections in the students while providing them with additional methods and tools to facilitate discussions and other collaborative activities. Notably, providing SI leaders with some insight into social constructivist learning theory (Vygotsky, 1978) might help them understand the intention of not answering questions directly. Furthermore, SI session promotion and the information provided to first-year students should be elaborated, including a description of the intentions of SI and self-directed learning, an explanation of the rationales of learning strategies and how these are utilised in SI sessions, and the outcomes. Päuler-Kuppinger and Jucks (2017) examined the perceptions of teaching and knowledge acquisition and found that students prefer teacher- and content-centred conceptions (that is, high teacher activity with low student activity), while academics held more student- and learning-centred orientations with a focus on the student and their learning processes. The study concluded that students must be trained to change their role in the learning process and that academics should be aware of and be able to influence their students' approaches to learning (Päuler-Kuppinger & Jucks, 2017). Hence, a mutual clarification of expectations and approaches to learning processes and strategies

is recommended. Furthermore, we believe that a common understanding of the SI pedagogical model among all parties involved, including the students, is important to exploit the full potential of SI.

Students and SI leaders reflected on the learning strategies used in SI sessions, while SI leaders wanted more tools or activities that could be used to facilitate student activity. A review by Dawson et al. (2014) found that relatively few articles specify what occurs in SI sessions, which limits the generalisability of findings from published studies. While observational notes from SI supervisors might be useful, they are rarely treated as research data. A case study by Power and Kiyomi (2015) discussed the effectiveness of SI among first-year engineering students and included the reflections of a long-term SI leader, which provides insights into the activities used in SI sessions. This case study exemplifies that SI activities are not only dependent on the SI training, but also the context, the SI leader's experience, and the students' contributions and feedback. When implementing SI in a new context, the practical implications of the SI method are of interest, such as examples of various learning activities that can be used.

4.2 Organisation of the SI Programme

While PAL and SI in healthcare education are scarcely described in the literature, recent reviews describe heterogeneity in programme content and activities, duration, and number of participating students (Aburahma & Mohamed, 2017; Burgess & McGregor, 2018; Stone, Cooper, & Cant, 2013). Notably, inadequate description of the PAL format is evident in pharmacy education, and the organisation of PAL varies largely between different studies regarding aspects such as tutor training and peer-teaching format (Aburahma & Mohamed, 2017). While the SI programme is well-described in *The Leader's Guide to Supplemental Instruction* (The Curators of the University of Missouri, 2014), examples of SI organisation in pharmacy and nursing curriculum are lacking. Additionally, many interventions described as SI in the literature are modified, thus making it difficult to compare findings between studies (Dawson, van der Meer, Skalicky, & Cowley, 2014; Mosley, Maize, & LaGrange, 2013; Owens, Rainey, Tucker, & Edmunds, 2018). A special adaption of SI for this study involved sessions always being arranged by two SI leaders. The intention was that the two leaders could support each other and divide the group in two in case many students attended. Helde and Suzen (2019) reported a similar approach, finding that the presence of two SI leaders increased the feeling of safety and made it easier to organise and follow-up with individual students in the SI sessions.

When evaluating the SI programme, students and SI leaders had many thoughts and opinions regarding the organisation of the programme, which highlights the need to continuously assess the design and outcome while adapting and optimising the programme to the context. Communication between programme staff is also of great importance. Although collaboration between SI leaders, SI supervisors and other academic staff was a priority in the implementation process, the evaluation shows potential for improvement. Those involved must be thoughtfully selected, trained and

supported throughout the implementation since programme success is determined by the people involved (Wilcox, 2008). However, we had a limited capacity for SI supervisors to observe SI leaders during sessions. Helde & Suzen (2019) described the importance of allocating time to reflect on one's own experiences as an SI leader. In their study, SI leaders described reflection and supervision as important for their development. A review of PAL in nursing education also concluded that effective interventions within the curriculum required adequate academic supervision (Stone, Cooper, & Cant, 2013).

The low and rapidly decreasing attendance at SI sessions during the courses necessitates a discussion regarding whether at least some of the sessions should be compulsory to familiarise students with the model before they take an active standpoint on whether or not to attend SI. Mosley et al. (2013) argue that mandatory attendance may be required due to a high number of students not seeking academic assistance. However, this notion is not aligned with some of the main principles for SI (i.e. inner motivation and curiosity are the central driving forces for participation; Helde & Suzen, 2019). The present work found that while participating students indeed were motivated, more extensive SI promotion and incentives to participate could also be utilised.

4.3 Outcomes of the SI Programme for Students and SI Leaders

While increased academic performance and student retention due to SI has been thoroughly documented in the literature, outcomes related to the students' and SI leaders' perceived benefits are scarcely reported. Such studies have generally included performance ratings using Likert scales. However, Bruno et al. (2016) reported many of the same outcomes that we found in this study – students felt more prepared for their exams, considered the setting as safe for asking questions, enjoyed the variety of methods used, and appreciated the SI leaders' advice. For SI leaders, the perceived benefits included increased social skills and the experience of working in a team. Bruno et al. (2016) also identified flexibility and increased knowledge in teams with numerous leaders. In our study, SI leaders stressed their improved insights into pedagogy and learning strategies. Therefore, SI may not only have effects on the students participating but may also serve as professional development for leaders (Bruno et al., 2016; Helde & Suzen, 2019).

Existing scientific evidence on the impact of PAL within pharmacy and nursing education is particularly limited (Aburahma & Mohamed, 2017; Burgess & McGregor, 2018; Stone, Cooper, & Cant, 2013); however, the outcomes of PAL are not expected to diverge significantly from those of other study programmes. A review published in 2017 examined the application and effectiveness of PAL within pharmacy education (Aburahma & Mohamed, 2017). This review included six educational research articles containing PAL activities (none of which involved SI) and – based primarily on subjective questionnaires/surveys with Likert scales – reported that PAL was well received among the students and had a positive impact on their learning outcomes.

However, the review provided no information regarding the impact of the interventions on peers (Aburahma & Mohamed, 2017). Furthermore, a review on the value of PAL in undergraduate nursing education (including 18 studies, none of which involved SI) reported numerous benefits from the PAL interventions among students, including increased confidence and competence as well as decreased anxiety. The peers benefited from PAL by gaining skills that prepared them for their role as registered nurses (Stone, Cooper, & Cant, 2013). Additionally, a qualitative systematic review including six studies (none of which involved SI) exploring PAL experiences among undergraduate nursing students found that PAL interventions contributed to student learning processes and prepared them to become professional nurses. The nursing students gained skills and competencies through personal and professional development (Nelwati, Abdullah, & Chan, 2018). In summary, the outcomes of the SI programme in pharmacy and nursing education presented in the present study align with and expand on the previously reported outcomes of PAL interventions in healthcare education.

Reviews of PAL interventions in healthcare education generally report the poor generalisation of results due to an insufficient number of studies and methodological limitations. As a result, they often recommend further research to fully investigate PAL programmes and their effects, while highlighting the need for high-quality research with consistency in the use of terminology, the reporting of PAL programmes, and the combination of objective and subjective evaluation methods (Aburahma & Mohamed, 2017; Burgess & McGregor, 2018; Stone, Cooper, & Cant, 2013). The implementation of PAL programmes would also benefit from continuous evaluation while combining qualitative and quantitative evaluation methods.

4.4 Strengths and Weaknesses of this Study

To the best of our knowledge, few studies (e.g. Bruno et al., 2016) have investigated experiences in the implementation of a 'true' SI model in nursing and pharmacy education (i.e. an implementation complying with the SI manual). Moreover, few studies have collected qualitative feedback on students' and SI leaders' perceived benefits from SI participation. In the present study, the two included study programmes are relatively diverse – as are the authors' backgrounds in research. However, the two courses in which SI was piloted are similar in theoretical content. While implementing SI, we focused on following the principles for the SI model strictly (Stone & Jacobs, 2008). We chose historically difficult courses, arranged voluntary weekly SI sessions, recruited SI leaders among students who had performed well in the courses, provided a two-day SI leader training course and specifically focused on giving SI leaders instructions on what *not* to teach students while emphasising supervision and the facilitation of discussions. Earlier studies have shown a lack of screening in the recruitment process of peer teachers (Aburahma & Mohamed, 2017). One major strength of our study – and the SI model in general – is the focus on recruiting role models.

One limitation of this study is that a relatively small group of students attended the SI sessions. Therefore, we do not expect these students to be representative of the majority enrolled in the two study programmes. Self-selection bias has been thoroughly discussed in the context of SI (Dawson, van der Meer, Skalicky, & Cowley, 2014; Malm, Bryngfors, & Fredriksson, 2018). Some informants in our study had the impression that the 'strongest' students did not see the usefulness in attending SI sessions. Additionally, a reduced number of attendees from the first session and throughout the duration of the courses might be a signal that the SI sessions did not meet students' expectations. Furthermore, although our findings concerning the outcomes of attending the SI sessions are in line with the literature (Aburahma & Mohamed, 2017; Bruno et al., 2016; Burgess & McGregor, 2018; Stone & Jacobs, 2008), we do not know how students who attended SI will perform later in the study programme.

4.5 Conclusion

SI is an internationally recognised pedagogical model designed to help students in their learning through peer facilitation. However, scientific evidence related to SI in healthcare education remains limited. Notably, the present work is novel in providing a detailed description of SI programme implementation in pharmacy and nursing education, including the content of SI sessions, which have not been well described in the existing literature. The success of a peer-led intervention is dependent on both the learning activities and the people involved. Hence, the organisation of SI programmes is of great importance and should be continuously evaluated, preferably using a mixed-method approach. The SI programme described in this study had a positive impact on both pharmacy and nursing students as well as SI leaders and lays the foundation for the further development and utilisation of the SI programme in healthcare education.

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6 Technology and Education – The Attitudes of Distance Students Towards Supplemental Instruction Online

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Abstract: Students taking net-based courses often find themselves somewhat isolated (Lehman & Conceição, 2013) from both their peers and their instructors. This can explain why they may not complete a course or not perform as well as expected. Supplemental Instruction (SI), initially set up to help struggling university students, is now a well-known system of student-led group work (Dawson, van der Meer, Skalicky, & Cowley, 2014,) that is a potential method for dealing with online students' feelings of isolation and enabling them to achieve the same positive results as campus-based students (Hizer, Schultz, & Bray, 2017). This chapter analyses students' attitudes towards SI online. The chapter begins by outlining the similarities between so-called high-risk courses and distance courses. It then discusses students' attitudes towards SI in an online setting, based on a survey of online language students. The chapter concludes with suggestions on how to adapt SI for an online setting, considering the possibilities and restrictions imposed by virtual meetings.

1. Introduction

Supplemental Instruction (SI) has traditionally been used to support campus students of science, technology, engineering, and mathematics – so-called STEM students (Dawson, van der Meer, Skalicky, & Cowley, 2014, p. 610). It has mainly been used in what has been named high-risk courses, or courses with a high dropout rate, few contact hours with peers and instructors, and a lot of new material to absorb. These courses are often taken during the first or second year of a university programme (Buchanan, Valentine, & Frizell, 2019, p. 288). Research from various countries and educational settings shows that students choosing to attend SI while taking these high-risk courses achieve higher grades, have lower dropout rates, and are more likely to complete their studies than students who do not attend SI (Dawson et al., 2014; Malm, Bryngfors, & Mörner, 2012; Hizer et al., 2017).

However, in today's technological world, distance or online courses, well known for their low completion rates (Bornschlegl & Cashman, 2019), are emerging as a new form of high-risk course. Despite high dropout rates, this form of teaching has become increasingly common in universities all over the world during the last decade (Walter, 2016; Viberg & Berg, 2018) and has created opportunities for students who, for different reasons, might not have been able to obtain a university degree through campus studies. Bornschlegl and Cashman (2019) point out several factors behind its popularity, such as planning one's own time, balancing studies with a job or a family, and living in a remote area. Although it is tempting to see only the benefits of equality

and accessibility of online teaching, this form of study means that many students end up studying from their homes with only limited interaction with their fellow students and teachers. The problems faced by students entering university directly from high school, such as a higher level and faster pace, a higher number of study hours per week, greater demands for independent time management and fewer feedback and support opportunities (Malm et al., 2012) are also valid for online students, with the added burden of not naturally meeting classmates in the lunchroom or library to vent about problems or, without previous planning, study together.

Although some students prefer to have as little contact as possible with fellow classmates and teachers – Kayser and Merz (2020) call these pupils the lone wolves – many distance students look for opportunities to communicate with other students and instructors, and the longer they study the more synchronous communication they prefer to have (Kayser & Merz, 2020). Facilitating this type of communication, and thus helping students deal with the idea of feeling isolated from peers and instructors, can be one way to prevent online students from dropping out (Lehman & Conceição, 2014). Similarly, distance students who find their studies enjoyable and feel that they have opportunities to seek and get assistance from their institution are more likely to persevere and complete their programmes (Brubacher & Silinda, 2019). Hence, a key factor affecting both students' inclination to complete a course or programme and their feelings of belonging to a university is communication and meetings and, furthermore, a possibility to obtain guidance when needed. SI neatly fits these needs by offering students collaborative activities focusing on 'what to learn' in combination with 'how to learn', under the guidance of a senior student (Malm et al., 2015), and an opportunity to interact and discuss with peers to reach new ways of understanding difficult subjects (Buchanan et al., 2019). Using SI online thus seems both a suitable and necessary solution to the problems of retention and students' feelings of dissatisfaction with their studies.

2. Supplemental Instruction Online

SI online has been tested at different universities (Spaniol-Mathews, Letourneu, & Rice, 2016; Hizer et al., 2017; Jimenez, 2018; Shaw & Holmes, 2014). All the researchers are keen to point out that SI online is a very scarce phenomenon, and the main objective for most of the studies has been to compare SI on campus with its virtual counterpart. These studies have all focused on cases where SI was offered in an online format to campus-based students who could not get to the campus SI classes. They were not specifically targeting students who were studying only online. Nevertheless, the studies are interesting because they investigate whether the form of delivery, be it in 'real life' or in virtual reality, affects the results of the Supplemental Instruction the students received.

The common conclusion seems to be that SI online has similar results to SI on campus. Hizer et al. (2017) show that students within the biology department of their

university who attended SI, whether in its campus-based or online form, raised their grades and were less likely to drop out or fail a course in comparison with non-participants of SI. A similar conclusion was reached in a study of first-year chemistry students who were divided between campus and online peer-assisted learning groups. The results these students achieved in their coursework and final exams did not differ based on which group they belonged to (Smith, Wilson, Banks, Zhu, & Varma-Nelson, 2014).

The research cited here used different forms of SI online but the focus for all of them was to allow a greater freedom for students to access SI when and where they were able to (Spaniol-Matthews et al., 2016; Hizer et al., 2017) by removing the limits of time and space. Spaniol-Mathews, Letourneu, and Rice (2016, p. 21) argue that SI online is essentially the same as traditional SI, except that the participants communicate through a device rather than in person. However, the authors later state that the SI sessions are recorded so that students who missed them can watch them another time, thus changing the SI sessions from interactive meetings to sessions of passive listening. Similarly, Hizer et al. (2017), who also stated their intention to mimic the campus SI experience online and recorded the campus sessions for later viewing, further offered their SI online in the evenings, whereas their campus SI was offered during the daytime, and supplemented these sessions with an online forum and worksheets accessible online.

Shaw and Holmes (2014, p. 105) state that, for SI online to be successful, the interaction between students and the SI leader is vital, even though the form of communication can vary. We can assume from this that they too consider asynchronous forms of communication. The students who received their SI online were either strongly in favour of it, often due to the flexibility it offered, or strongly opposed, since they preferred the traditional classroom set up (Hizer et al., 2017). The research further suggests that SI can be a potential way of dealing with students' feelings of isolation (Hizer et al., 2017) and can lessen the stress that missing out on academic work because of family or work commitments can cause (Spaniol-Mathews et al., 2016).

2.1 SI Online for Distance Students

When it comes to supporting distance students, in many cases their needs are similar to those addressed by SI. For example, study skills and techniques, one of the foundational aspects of SI (Malm et al., 2015), are of paramount importance for distance students (Kayser & Merz, 2020, p. 90) since they are often left to their own devices. As noted in the introduction, distance students are often non-traditional students: students who work, have a family, or who have parents who did not go to university and, therefore, might need extra support with their studies. This is also the same group – non-traditional and minority students – that, according to Buchanan, Valentine, and Frizell (2019), gain the most from SI attendance even when other factors influencing their studies are removed (Rabitoy, Hoffman, & Person, 2015). These students are likely to find writing, and especially academic writing, complicated. Although SI does not

necessarily practice writing longer texts and articles in its sessions, research shows that SI participants improve their academic writing skills (Dawson et al., 2014). It also shows that simply knowing that help is available, in the form of a peer or mentor, can in itself enable students to handle the stress they feel when studying (Dawson et al., 2014). Students who are encouraged to seek help and are shown that help-seeking is a way forward rather than an admission of failure are more intent on completing their studies (Brubacher & Silinda, 2019).

Another aspect that is worth considering when it comes to SI online is the importance of interpersonal relationships between students and the impact this can have on attendance (Goldstein et al., 2014). In the campus environment, influential students with a positive view of SI can inspire large numbers to attend. Online students often have weaker relationships with their classmates because the virtual classrooms in which they meet are live only during formal teaching sessions, thus limiting the opportunities they have to chat and meet people, either before or after class. However, if good relations between students can be built and fruitful interactions between them fostered, research has shown that this can lower the dropout rates from distance courses as well (Bornschlegl & Cashman, 2019). One way of forming such relations is through SI sessions, which have been shown to generate enhanced social relationships between peers and a sense of being part of university life (Dawson et al., 2014). It has further been shown that although online collaborative spaces in general are important for students' learning, the addition of a leader, the opportunity to ask questions in real time, and the ability to meet other students can lead to positive feelings of a shared community (Foley & Marr, 2019). This is another reason to implement SI programmes, even for distance students.

3. Background for Our Research Questions

The studies mentioned above outline successful efforts to implement SI online. However, as noted before, these studies used online SI as a way of targeting campus-based students who could not attend SI on campus, not students who were only studying at a distance. At Dalarna University, a small university in the middle of Sweden with about 15,000 students, roughly two-thirds of the student body study either entirely at a distance, meaning they never come to campus, or in a blended format, meaning they only rarely attend sessions on campus. Among the first disciplines to move their teaching online were the languages, which have been teaching online since the early 2000s (Lindgren, 2020). In 2020, most of Dalarna's language students are taught online through a combination of synchronous, scheduled seminars with teachers and fellow students and a variety of asynchronous activities. The situation for these students is therefore somewhat different from the students participating in online SI described above. They are, however, very similar to the distance students described at the beginning of the chapter.

The language department at Dalarna University has for some years tried to break the trend of high dropout numbers and low completion rates. Another area that the department has worked hard with is the wellbeing of both teachers and students in the online environment. One of the strategies the authors of this chapter have been looking more closely at, with regards to dropout rates and wellbeing, is SI. We have participated in the three-day course for SI instructors and have begun to explore the potential for using SI in the online learning environment. Since our teaching situation differs from the campus-based STEM courses mentioned above in both content and delivery method, we decided that before we commenced a SI programme, we needed to investigate the possible interest and demand for such a project.

Language courses taught through distance learning follow the general trends for this format, with a fairly high dropout rate, especially at the lower levels. Entry-level language courses can be classified as high-risk courses, with large numbers of students (many of them studying online for the first time and maybe also at university for the first time), limited contact with peers and instructors, a fast pace of learning, and exams based on applied knowledge. This type of course easily fits the description of one that could benefit from SI, at least from a teacher's perspective. What we are curious to investigate is if this also is the perception of the students.

Through the bi-annual surveys that Dalarna carries out on its student body to see who they are, why they have chosen Dalarna University, their satisfaction with the courses they take, and other engagements they might have while studying, we know that our average language student conforms with the picture painted by Brubacher and Silinda (2019) as a person who works and has a family and other commitments in addition to their studies (Hofverberg, 2018; Hedlund, 2014). We therefore assumed that an extra scheduled meeting would not be of interest to the students but wanted to investigate if this was the case. To determine if an SI programme would be sustainable at our university, we also wanted to see if students would be interested to act as mentors (SI leaders).

3.1 Research Questions

Our main research question is to investigate the attitudes of web-based students towards attending SI online. Our sub-questions are:

a) Do net-based students see a need for Supplemental Instruction?
b) Do net-based students feel that they have the time to attend Supplemental Instruction?
c) Are net-based students willing to invest time and effort in becoming mentors?

3.2 Research Design and Methodology

To answer our research question we have used a combination of quantitative and qualitative approaches through a survey with open-ended questions and *yes*/*no* alter-

natives. The survey format was chosen to obtain a quantitative result through a substantial response rate. The questions were designed to allow for a qualitative analysis of the free-text answers.[1] Because students are generally unfamiliar with the concept of SI, using open-ended questions enabled us to provide a structured interrogatory framework to the subjects without influencing the content of the answers. To find an answer to our main research question regarding net-based students' attitudes towards SI, we perform a descriptive analysis of the collected data as well as a reflexive analysis of the free-text answers. In our survey, we were interested in four areas:

1. If the students felt that there were difficult sections in their studies.
2. If they would have liked a mentor or a peer to guide them through their studies.
3. If they felt they had the time, or would take the time, to attend extra instruction.
4. If they could see themselves as mentors to other students.

The answers in the four areas were then grouped in sub-categories based on similarity. The first area was chosen to see if the instructors' perceptions of the courses as challenging corresponded with the students' evaluations of them to deem the courses suitable or unsuitable for SI, since SI is only meant to be used on courses where students need extra support (Malm et al., 2015). The second area was chosen to see if students would welcome the implementation of SI since it is known from previous research that the students' attitudes towards SI are a key factor in the success of the programme (Goldstein, Sauer, & O'Donnell, 2014). The third area was chosen since we know from previous research (Foley & Marr, 2019) that distance students often have limited time to spend on extracurricular activities, and we wanted to see if students would be willing to spend time on SI. The fourth area was chosen because SI programmes need students to act as mentors. Given what we have already said about the time pressures on distance learners, we wanted to know if the students in our study would be willing to act as mentors to see how sustainable it would be to set up an SI programme at the university.

The questionnaire was distributed via email to 442 students who were enrolled in at least one language course at Dalarna University in the autumn of 2018 and who had previously studied languages online at the university during at least two other terms since 2016.[2] The questionnaire was sent in October, about a month after the beginning of term when students had settled into their courses, and a reminder was sent two weeks later. The students were informed that the questionnaire was completely anonymous.

In total, 149 students answered the questionnaire, which was conducted using Survey Monkey, a web-based survey platform. Of the students who answered,

1 The questions on the survey were written in Swedish. We have translated the questions and the students' answers to English for this chapter.

2 The courses in the language department at Dalarna University are often taught term-wise rather than for the full academic year. Students might also take courses from several departments, hence, they may not study all terms of a degree in the same department.

111 were studying one language at Dalarna University. The most common languages studied were German (19 students), French (17 students), and Chinese (16 students). Thirty-eight students were studying more than one language, and among these the following combinations were most popular: English and German (5), Japanese and Chinese (5), and Arabic and French (4). Several other language combinations were noted. One student was studying four languages (Italian, Russian, Portuguese, and English), although combinations of three were more common: Arabic, Swedish, and English; French, Portuguese, and English; French, Portuguese, and German; German, Japanese, and Swedish as a second language; Japanese, Chinese, and English; and Portuguese, Japanese, and Chinese.

3.3 Descriptive Analysis

The first area we were interested in was the perceived difficulty of the courses studied. As shown in Table 1, 102 of the students stated that there was a course or a module in a course that they had found difficult, 36 said there was not, and 9 of the students answered that they had no opinion. A total of 147 students answered this question.

Tab. 1: 'Was there a course or module in a course that you found difficult?'

Responses	N
Yes	102
No	36
No opinion	9

The students who answered *yes* were then prompted to elaborate on their answers and give examples of difficulties they had encountered. We did not specify what we meant by 'difficult' to avoid influencing the students in their responses. We received 108 responses to this question, which means that some of the students who answered *no* or *maybe* also filled in the free-text answer. The answers were grouped into six categories: vocabulary, literature, written expression, grammar, oral expression, organisation of the course, and 'varied content'. Some of the students listed more than one difficulty with their course.

The smallest category of responses related to acquiring and using vocabulary, both in oral and written exercises. Students said that they had trouble learning 'words to be acquired out of context' and 'words one should know', while two students named Chinese signs as a particular difficulty. Similarly, a few students mentioned the idea of 'literature' or 'literary theory' as problematic. A larger number of comments related to difficulties with written expression. Here, seven students talked about the difficulties they had writing their examination essay and following the rules for academic writing and referencing. Two students simply said 'writing' and 'written assignments' without specifying what their problems with these areas were. It should be noted that the students who took part in this survey were taking courses at different stages of the

language programme, so they will have had different types and lengths of written assessments to complete. A larger category of responses included references to grammar where students mentioned things like 'case', 'verbal aspect', and 'verbal forms'. Two students mentioned the problem of having grammar explained to them in a foreign language, and two referred to 'linguistics'.

The second largest category of responses referred to the oral aspect of learning a language. Six responses said 'speaking' was difficult, while others made similar comments, such as 'phonetics' (4), 'conversation and discussion' (3), 'expressing oneself' (3), and 'pronunciation' (2). Three students talked about 'oral presentations/presentations' and three mentioned 'listening comprehension'. One student said, 'it is difficult to study oral skills on one's own', which refers to the limited lesson time of approximately four hours per week that a full-time student receives.[3]

The largest category, appearing in a total of 37 responses, was also the most varied. Twelve respondents wrote in very specific terms about the poor organisation of the courses, which they considered 'confusing', 'badly structured' (within a course or between levels), or not corresponding to the prerequisites. An equal number of responses talked about excessive quantity of work, saying they had 'too much to do', 'too much to read', or 'too much to do at the same time'. Ten responses raised the issue of time ('the courses take too much time', 'we had too little time', 'the deadlines are too strict', 'a lot of stress during seminars', or 'it's difficult to make a timetable'). In nine answers, difficulties with the course were linked to the instructor, such as 'the teacher speaks too fast', 'the teacher does not speak Swedish', or on the contrary, 'the teacher speaks Swedish'. We will not dwell on these difficulties which can be personal and sometimes temporary (these are the students' feelings while completing the survey). Similarly, four responses identified course assessments as a source of difficulty, saying 'questions are too hard in the exam', 'too little time in the exam', and there was 'only one final exam for the whole course' instead of several exam opportunities.

In addition to the above categories, the responses raised two further points. Two mentioned the problem of 'students who already know how to speak the language', which hampers less competent students from learning, and two mentioned 'too few contact hours', a point that we will come back to in our analysis.

Some responses have not been categorized. One student blamed themself for their difficulties, saying 'I didn't devote enough time to my studies and always did homework at the last minute'; another raised the cultural and linguistic difficulty of learning a language (in this case, Portuguese) that was spoken differently in different countries. Two mentioned their difficulties with distance learning ('studying at a distance, without meeting each other', or 'the feeling of loneliness'), and three mentioned the various technical problems that can accompany web-based learning. Finally, it is interesting to note that ten answers mentioned no difficulties, but were, on the contrary, very positive: 'the grammar courses were very good', 'sometimes it is hard but you feel good

3 The teaching time is the same for on-campus and online courses.

when you finally get there', or 'there are difficult moments but achievable by dedicating time and concentration', were typical responses.

The next area we were interested in was the role of a mentor. As Table 2 highlights, 51 students answered that they thought their studies would have been easier had they had the opportunity to get help from a mentor. The question was answered by 137 students, 11 of whom misread the question and answered by saying, 'no, I didn't have a mentor', in the place for free-text answers.

Tab. 2: 'Do you think your studies would have been easier if you had had help from other students on "how to study", i.e. advice on how to study, how to think/prepare while studying, etc. during your studies?'

Responses	N
Yes	51
No	42
Maybe	18
Do not know	15

Combining the answers for 'yes' and 'maybe' indicates that 69 of the students are not opposed to the idea of a mentor. All the students were then asked to develop their answers by answering the following question: 'How would a mentor (a former student who took the same courses) have influenced your studies/course results?' In the free-text answers, some of the students elaborated on why they thought a mentor would be a good idea (or not). Among those who answered 'yes', some modulated their answer by commenting that such a mentor would have had an influence on their studies but 'not much' or 'marginally', or 'not much but it would bring a feeling of security', or 'not much but it would have supported me' (six answers modulated in this way). Students who answered positively mentioned the opportunity of discussing difficult points, which take a long time to learn, or getting support. One student answered positively on behalf of others, saying 'personally I have not encountered any difficulties during the course, but in general many would appreciate more help'. Some were enthusiastic, for example, writing 'what a good idea!' or 'it would have been of great value!'. Finally, some spoke in concrete terms about how this potential mentor could 'explain what to do or how to do it', or would be a useful support 'not about the technique to study but to practice', or 'I need someone I would admire, who has a lot of experience'. The students who answered 'maybe' said that such a mentor would allow for 'interaction with others' and 'speaking more of the language, as it is a problem not to be able to practice with someone'. Another respondent thought that 'it might be positive if you took the time to do it and if it was not considered as an extra thing to do'. One student talked about the possibility of developing what they called 'structured independent learning with others'. One added that 'it would perhaps increase my joy in studying'. Some said that if they answered 'maybe' it was because it depended on the mentor or

'it depends on what it would be like online'. Finally, one student replied, 'maybe, but it's just as well to interact with the other students in the course'.

The next question in this area was more specific and gave examples of possible advice that a more senior student could give. As shown in Table 3, 63 students stated that they thought help with 'how to study' would have made their studies easier. This question received 148 responses.

Tab. 3: 'Do you think that your studies would have been easier if you had had help from other students on "how to study", i.e. advice on how to study, how to think/prepare during your studies, etc.?'

Responses	N
Yes	63
No	62
Do not know	23

The responses were almost equal between *yes* and *no*, with 63 students saying *yes* and 62 students saying *no*. There was not a *maybe* option in this question, nor could students write a free-text answer.

The next area of questioning focused on time (Table 4). We wanted to see if students would be willing to use their time for extra tuition, and 80 students answered that they would have taken the chance to do two hours of groupwork with a mentor every week. This question received 149 responses. This question did not have the option of *maybe*, and there were no free-text answers.

Tab. 4: 'If there had been an opportunity to work in a group under the guidance of a mentor, about 2 hours a week through a Connect[4] meeting would you have taken it?'

Responses	N
Yes	80
No	40
Do not know	29

The final area deals with the issue of the students volunteering to become mentors (Table 5), and 57 students answered that they would be interested in training to become a mentor. This question received 148 responses.

Here, even though 62 students were negative and 29 were hesitant, it should be noted that 57 students answered positively. As we have seen, the SI approach uses student volunteers who are interested and willing to get involved in helping their peers,

4 At the time of the survey, Dalarna University was using Adobe Connect for synchronous online meetings. All students would have understood that this reference meant a synchronous online meeting with audio and video capacity that allowed them to participate and discuss with other participants in an active way.

Tab. 5: 'Would you be interested in training to become such a mentor?'

Responses	N
Yes	57
No	62
Do not know	29

hence, it is not something that all students need to be interested in. This question did not have the options of *maybe* or free-text answers.

At the end of the survey, students were given the opportunity to comment on aspects of the topic that they thought would be of use. Some of the answers concerning teachers, technology, and structure are not reported here since they are not relevant for our topic. However, some students mentioned that 'more opportunities for practice are needed' (1), 'more oral training is needed' (4), more 'conversations on discussion forums' (1), and 'more grammar is needed' (3). One student mentioned that priority should be given (presumably when working with a mentor, but this is not specified) to what really matters – that is, the course essay. Another student talked about motivation and said, 'I would need a mentor who could help me with motivation, which disappears from time to time, for different reasons. It would have made my job easier and it would have helped me to focus on what is most important, to take small steps towards the goal instead of waiting for inspiration'. Three students mentioned study techniques. One student pointed out that, in fact, there were already study technique tips on the university's web page for those who were willing to take the time to read them. Another student said that the language they were studying was more difficult to learn than others, which made effective study even more important. A third student pointed out that advice on how to study and methods of studying would have been welcome, although in fact according to this student it is a better idea to converse with someone who has the language as their mother tongue than to work with a mentor.

Some answers spoke directly about mentoring or similar methods. We have grouped these answers into two categories. The first group of responses (5) is eclectic. One student would like to be motivated, another wanted to be encouraged to become more involved in their studies, two pointed out that they already had small groups that met and helped each other, and one said that time invested in setting up a mentoring scheme should be used for other things, such as 'creating a web page with videos, articles, information, etc. to facilitate learning'. The second group of responses (14) includes students who explained why they could, or could not, be a mentor themselves. For example, one student said that they were an experienced student, had a master's degree, and were studying at several other universities. The idea of mentoring seemed good for new or young students, but this student did not see it as necessary for their own situation. Another student said that their results were poor, so they would not really be qualified for such a position. Several responses highlighted what a mentor might or might not do. One student said that a mentor would be good, not to help with study techniques but for the subject matter itself. Some also admitted that men-

toring took time and might not be followed through in the end ('my experience is that extra stuff tends not to get done').

4. Reflexive Analysis

The first area we wanted to explore was students' perceptions of their studies, and if they felt there were difficult aspects of them or not. As the above answers show, 102 of 147 students found a course or an aspect of a course in the language department difficult. The students' answers correspond with our hypothesis as instructors, which is that many of our students struggle with their courses in different ways. Since we did not specify the meaning of 'difficult', students' answers ranged from practical matters, such as the organisation of a course, to specific parts of the content, such as oral proficiency, vocabulary acquisition or grammar, and academic writing. Many of these themes could be easily discussed in an SI session where students collectively work through grammar rules, work collaboratively around concepts and theories, and together work on study techniques for learning vocabulary. Studying grammar at a university level requires a certain way of thinking and reflection that differs greatly from the way grammar is treated in Swedish high schools. For many students, this new approach is an area where SI discussions could be beneficial. Although it is not clearly stated, it is easy to speculate that those students who stated that there were too much material and unclear instructions could benefit from sessions on general study techniques. This would help them gain the confidence to make choices about what to study and what to ignore.

The second area we wanted to investigate was whether or not students would have liked a mentor or a peer to guide them through their studies. The results showed that students were not sure what a mentor could help them with: 18 said that maybe a mentor would be useful and 15 said they did not know, whereas 51 of 137 students answered that they would have found a mentor useful. The students were somewhat more positive when asked if they would have liked a mentor to give them advice on how to study or think while at university; here, 63 of 148 said yes, while 23 stated that they did not know. Students' reasons for believing that a mentor would have been a positive influence on their studies ranged from cautious assumptions to enthusiastic exclamations. Some students unknowingly specified exactly the goals of SI in their answer ('develop structured independent learning', 'bring joy to my studies'), while others related to their desire to speak and to practice the language studied. Only one student mentioned the fact that these courses would be taught at a distance, showing that our students, familiar with the interaction and real-time contact of their current language courses, do not make strong distinctions between on-campus and online courses, as interaction and real-time contacts are the basis of our language courses. In the final comments, some of the students brought up the importance of motivation for successful study, which is another theme that SI groups can help with. They also mentioned study skills and techniques as topics they would like to discuss with a mentor.

The third area we looked at was the students' preparedness to participate in SI and if they felt they had the time, or would take the time, to attend extra instruction. The answers here, where 80 out of 149 students said that they would consider spending two hours per week with a mentor, was the answer that surprised us most. We had assumed that students with their already tight schedules would not see the benefit of this type of activity. The final comments added by the students also showed that at least some of them felt that they had too few contact hours with instructors and fellow students and that they, contrary to the stereotypical view of distance students, would prefer more scheduled activities where they could interact and communicate.

The fourth area discussed the likelihood of a student becoming a mentor to other students. Even though 62 of the students said they would not be willing to take on this role, the 57 who said yes would be enough to run a sustainable SI programme. It is also possible that when the role of an SI mentor is explained, and their training is made clear, that interest in working as a mentor might increase. As a first indicator, however, these are positive figures.

5. Results

Our main research question was to investigate the attitudes of net-based students towards attending SI online and we found that a majority of the students who participated in our survey were positive to the idea.

As for the sub-questions, a majority of the students who answered the survey saw a need for Supplemental Instruction, for themselves or for their peers in the online language courses they studied. A majority would also have taken part in a two-hour-per-week extra SI class, had that been offered. As for the question of becoming a mentor, 57 of 148 students answered that they would be interested in becoming a mentor.

6. Applying Supplemental Instruction Online

Having now established that the students are potentially interested in online SI, both as participants and as future SI leaders, we have started to look at the practicalities of how we might apply SI in the online environment. One thing that distinguishes SI from other peer-assisted forms of learning is the idea that it follows the same methods and practices all over the world and thus has an in-built consistency (Dawson et al., 2014, p. 610). Its core principles, as outlined in the SI manual (2003), are the facts that participation is voluntary; the SI leader is a previous student who acts as a peer, not a teacher, with whom one can discuss the content of a course as well as ways of studying it; and that the material to be tackled in each SI session is decided on in collaboration with the SI participants (Malm et al., 2015). Naturally, while transferring SI from campus to an online setting, these are important factors to keep in mind. However, not everything from the traditional SI setup can be translated into the virtual world (Jimenez, 2018). There are several parameters that need to be considered

when making this transition. First, although our SI programme would use software that allows for synchronous video conferences, human interaction on screen and in real life differs; it is, for example, more difficult to maintain eye contact through a screen (Mlynář, González-Martínez, & Lalanne, 2018). Online communication with larger groups often needs someone to organise the speaking order, which can remove some of the spontaneity found in a real-life classroom where it is easier to fall in and out of conversation. Most online communication platforms are also organised around a host or owner who has access to more functions than the participants of the meeting, which can form a hierarchy between the SI leader, as the host, and the students. Online video meetings, while highly effective, still do not give access to the full range of body language and other verbal signals, which might lead to hesitation if a question is understood or if someone is about to answer it. Hizer et al. (2017) therefore suggest that the SI leader needs to leave an even longer waiting time before rephrasing a question or explaining a problem in the online version of SI. This is further complicated if web cameras are not used. Students might not be willing to use the camera (Hizer et al., 2017) if they, for example, are sitting at home and do not feel comfortable sharing their home environment with their classmates. On the one hand, a 'no camera' decision could facilitate access to an online SI meeting for students who are shy; on the other hand, by not using a camera, some levels of communication are lost and it becomes more difficult for both the SI leader and the other students to engage actively. There is a risk that the SI meeting, rather than being a collaborative activity, becomes another lecture where the SI leader speaks and explains, and the students use the chat for questions.

Although technology is always present in the modern-day classroom through phones, tablets, and computers, it is suggested that SI demands more of an SI leader when it comes to engaging students than campus SI because it is easy for online participants to get distracted by other web pages, emails, or social media whilst in a meeting (Spaniol-Mathews et al., 2016). This in turn leads to the fact that, although training is vital for campus SI leaders, it is even more important in an online setting (Buchanan et al., 2019) where the SI leader needs to be able to handle the technology as well as the pedagogical aspects of SI in addition to added competition for the students' attention. The positive aspect of this is that many of the traditional SI activities that use Post-it Notes, white boards, and large mind maps to share and save discussions can now be carried out using online documents that can be saved and shared between the students using document share platforms, although this of course requires students to demonstrate some technical competence to actively participate. Most students are comfortable using more advanced technology like shared documents, but with a varied student body amongst the online students, not everyone is necessarily able to do more than listen and speak, which is what a normal lecture would require. For SI online to function in an optimal way, there is a need for more research into online mentoring and possibly an adapted SI manual that takes into account the possibilities and limitations of an online setting.

7. Conclusions and Suggestions

From the results of our survey it seems that the attitudes towards SI online among net-based students is, overall, positive. The number of students who said that they would attend SI is relatively high, which is a good sign since evidence from other SI programmes suggests that the number of students who state an intention to attend SI is often higher than the actual number attending. The relative high interest expressed in taking part in SI can be further interpreted as an example of distance students' desire to communicate and interact with their fellow students to a higher degree than is offered at present at our university. SI would therefore be a way to increase students' interaction and collaboration with others without adding more teaching hours. It would also provide freedom for those who did not want to interact more to opt out of these meetings, something they cannot do with regular classes.

Many of the difficulties with learning that students mentioned in this study are topics that are dealt with in SI. An SI programme would have a beneficial impact on general academic skills such as academic writing. Implementing SI for online students from a particular discipline would have advantageous side effects for their overall study situation and would likely help a number of students to pass their courses.

During any training for new SI leaders that might be undertaken, extra time would be needed to consider the special requirements of SI online, such as the technical specification of the programmes used and which ones would best fit with the various SI activities described in the SI manual. Attention should be paid to the creation of environments that break the distance caused by computer screens and to the development of pedagogical approaches to the challenges of the here-yet-distant online student.

8. Limitations and Further Research

The questionnaire did not mention SI as a concept, nor did it explain it. This was done on purpose in order to not confuse students, as explained above. However, a closer explanation of the concept and how it works might have elicited different answers. In addition, the questionnaire was sent to a broad range of students: those who were far into their studies (writing their BA thesis) as well as those studying the first term of a language. This was done to obtain the reflective answers of experienced students, but the interest in a mentor might have been different had we targeted only first-term students. The students in this study were relatively willing to attend synchronous extracurricular SI meetings, however, all of them are used to scheduled online lessons where they meet fellow students and teachers. Distance students who study only through pre-recorded lectures and asynchronous communication might answer differently.

While we now have an indication that students see the idea of both an extracurricular support programme and a study mentor as beneficial, the next step is to pilot online SI sessions for one or two of the language courses and to evaluate the students'

participation patterns and feedback from them before embarking on a larger and more sustained programme and the possibility to have collaborative and interactive SI sessions online.

9. Summary

We began the chapter by outlining the type of high-risk courses, courses with high dropout rates and few contact hours, that traditionally have made use of SI. We then compared these courses with distance courses taught online and underlined the similarities between them. We argued that SI would be useful in supporting distance students. However, because many distance students often say they have very little time for extracurricular activities, we were interested to see how online students felt about the offer of help from a mentor outside of class time. To investigate this, we distributed a survey to 442 students studying a language online at Dalarna University and then analysed our results. The 149 answers we received show that most of the students have a positive attitude towards Supplemental Instruction in addition to their normal classes and that they were able to identify difficulties that would be suitable to target in a SI meeting. We then discussed how SI could meet the needs expressed by these students. The chapter concludes with ideas on how SI could be facilitated online while still retaining as much as possible of the interaction and collaboration between the students as one finds in campus-based SI.

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7 Supplemental Instruction (SI) in Europe: An Overview of Current SI Programmes

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Abstract: Supplemental Instruction (SI) is a 47-year-old proven peer-learning model that addresses student engagement, performance, and retention as well as the transition to higher education (HE). SI was developed at the University of Missouri–Kansas City in the US and has received wide recognition. Today the method includes practitioners across the United States and in several other countries around the world. SI was first adopted in Europe in the early 1990s at Kingston University in the UK and has since spread to numerous other Higher Education Institutions (HEIs) in the region. However, little has been published about SI in Europe besides some research papers addressing the impact of the method at specific HEIs. Thus, an overview of the SI programmes in Europe is of interest, addressing the number of HEIs that use SI as well as information on programme sizes, goals, outcomes, etc. The present study provides such an overview and presents results based on surveys sent to all supervisors trained in the methodology in Europe. The results from the study above have been published in their entirety (Malm et al., 2018). The idea is to continuously revise the contents of the report to include new programmes, exclude terminated ones, and make updates to existing ones. In that way, it can be a support for practitioners seeking contact with others or wanting ideas or information from other SI schemes. However, it is too extensive to be of interest for a more casual reader interested in SI in Europe. Hence, we offer this contribution to provide analysis, summaries, and conclusions from the data in the report.

Based on the quantitative data presented above, we can make rough estimates of some key numbers for SI in Europe today (based on calculated averages multiplied by the number of HEIs with active SI programmes):

- 73 HEIs have active SI programmes;
- ~285 active supervisors lead the programmes;
- 1,480 courses/modules are supported annually with SI;
- 7,000 SI leaders are employed each year;
- 79,000 students participate in SI each year; and
- 784,000 contact hours are held per year for students attending SI.

Thus, it may be concluded that the usage of SI is substantial. What obviously can be improved upon is the geographical distribution of SI programmes within Europe. The goals of SI – to increase student performance and retention, aid transition to HE, and improve student engagement – are of interest to any HEI.

1. Introduction

Supplemental Instruction (SI) is a peer-learning programme that was created in the mid-1970s at the University of Missouri–Kansas City (UMKC) to address declining student retention numbers due to a rapidly increasing and more diverse student body (Martin, 2008). The successful results combined with a strong emphasis on evaluation of the programme led to SI's recognition in the US as an exemplary educational programme by the Department of Education in 1981 (Blanc & Martin, 1994; Martin & Arendale, 1992). UMKC was also awarded with federal funds in 1984 (and over a 12-year period thereafter) to disseminate the SI model to other Higher Education Institutions (HEIs; Arendale, 2002). This led to a rapid growth of SI programmes across the US, and later internationally. In 2008, personnel from over 1,500 HEIs in 29 countries had been trained in the SI model (Martin, 2008). To support this international growth, UMKC established an International Centre in 2002 and began a programme to develop region-specific expertise in countries/regions where SI was growing quickly. Consequently, 'National Centres' or 'Regional Centres' were established and supported by 'Certified Trainers'. This enabled the model of SI to be more easily adapted to specific HE contexts.

In this chapter, we focus on the development of SI in Europe. Although SI is far from being as well adopted at HEIs as in the US, the SI model has received a large following at universities/colleges in Europe, primarily in the north-west. Furthermore, there are dissemination efforts being made to promote continuous expansion in Europe (see si-pass.lu.se/en/).

So far, little has been published on SI in Europe. Most work has involved studies on the impact of SI performed at specific SI programmes (e.g., Capstick, 2004; Chilvers & Waghorne, 2018; Ginty & Harding, 2014; Hull, Broome, Brown, & Portlock, 2017; Malm, Bryngfors, & Fredriksson, 2018; Malm, Bryngfors, & Mörner, 2011, 2015; Scriver, Walsh Olesen, & Clifford, 2015; Fostier & Carey, 2007). Thus, there is a void addressing more general questions regarding SI regarding, for instance, the number of HEIs having SI in Europe, the size of these, the reasons SI programmes were introduced, etc. The objectives of this study can be summarized as:

- Learn how many active SI programmes led by trained supervisors exist in Europe.
- Identify the age and size of the SI programmes (size determined from number of leaders, attendees, courses supported, trained supervisors).
- Know what the goals were for different HEIs when introducing SI and what they are today.
- Learn how leaders are trained and supported.
- Learn how the programmes are monitored.
- Know what names are used for SI programmes and how frequent they are used.
- Obtain examples from the HEIs on what differences their programmes make.

2. Method

In the study, we have used surveys sent to all trained SI supervisors[1] in Europe to obtain an overview of SI in the region. The first survey was relatively short to encourage people to participate, and it included a question asking whether the respondent was willing to give a more elaborate description of their SI programme. If so, a second survey was e-mailed to them. Both surveys are provided in the Appendix.

The idea behind the first survey was to obtain some basic facts, with respect to how long the SI programme had existed, information about SI leaders (how many, training and support of leaders, type of reward), and how the SI programme was evaluated. The second survey was designed to provide some more detailed information on:

- reasons for introducing SI at the HEI and current goals of the SI programme;
- history of the programme;
- size of the programme (number of supervisors, number of courses supported by SI, number of students having access to SI, number of students participating in SI, average number of attendees in SI sessions, average number of sessions per leader and year, average length of sessions, and total number of SI contact hours per year for participating students);
- examples of the impact of the SI-programme; and
- publications (if any) about the SI programme.

The reliability and validity of the answers can be expected to be good since they were provided from supervisors trained in the SI method. However, if an SI programme has existed for a long period, the history and reasons for introducing SI at the HEI may rely on second- or third-hand information that may be less reliable.

The methods of analysing the data were relatively simple. Quantitative survey data were summarized, and average values describing the size of SI at an HEI was multiplied by the number of HEIs with active SI programmes to obtain an estimate of the total number of leaders, participants, and active supervisors in Europe. However, the number of HEIs with active SI programmes might be underestimated since it is likely that not all supervisors responded to the survey or have descriptions of the SI programmes on the HEI's website. Qualitative survey data were analysed using thematic analysis, when possible, with some typical examples of responses provided below.

3. Results

To date (6 February 2019), 144 HEIs in Europe have had employees trained as supervisors in SI. Based on 63 responses as well as searches of active SI programmes on the HEI websites, we found that 73 (51%) HEIs in nine countries (England, Germany, Ireland, Northern Ireland, Northern Cyprus/Turkey, Norway, Scotland, Sweden, Wales)

1 SI supervisors lead the SI programme at an HEI. The supervisors have been trained in the SI method by certified trainers from a national/regional SI Centre.

have active SI programmes. Below follows a summary of the results from active programmes that responded to the surveys. Ultimately, 63 (86% of those with active SI programmes) HEIs answered the first basic survey, and 45 (62%) of these continued and completed the extended survey. Thus, the data should provide us with a representative picture of some key aspects for SI programmes in Europe.

3.1 Age of SI Programmes

Figure 1 displays the years when SI programmes were established at different HEIs. The formation of regional centres in Sweden in 2002 and the UK in 2009, merging into the European Centre for SI-PASS in 2017, certainly seems to have accelerated the introduction of new SI programmes, with about half being five years of age or less.

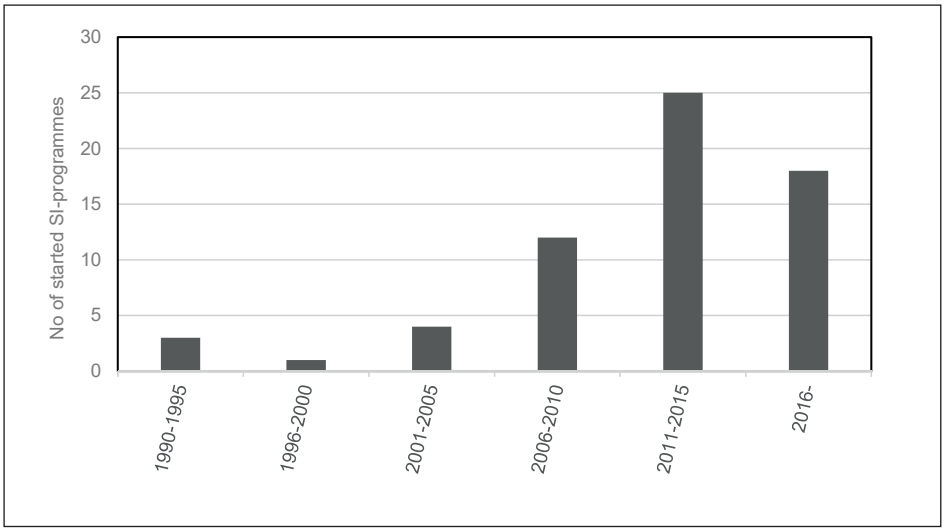

Fig. 1: Start-up year for SI active programmes in Europe (based on 63 survey responses)

3.2 Names for SI Programmes

Three main names exist for SI programmes in Europe (see Table 1). The original name, Supplemental Instruction, is used at all HEIs with SI in the Scandinavian countries (Sweden, Norway). This is not the case for the British Isles and Germany, however, where PAL and PASS plus a few others are used instead of SI. PAL stands for Peer-Assisted Learning, where sometimes an S is added in the acronym, standing for Scheme or Support. The acronym PASS usually stands for Peer-Assisted Study Sessions/Schemes, but other names like Peer-Assisted Student Success and Peer-Assisted Student Support exist. Other names for SI in the British Isles are Academic Mentoring, Peer Mentoring in Praxis (PMIP), Academic Peer Mentoring Scheme (APM), Peer Learning, and CÉIM (standing for step in the Irish language). Having your own local name can be important for the HEI in marketing and identifying their programme

internally. However, there are some risks to be aware of. Firstly, different names may lead to confusion if we are talking about the same type of programme, potentially hindering information exchange. Secondly, when creating a unique brand name it might be tempting to stray from the original model. Whilst this may be appropriate for the HEI, this means that the programme will not be comparable with others. The strength of the SI model, and consequently being able to draw on the literature, lies in having the same essential elements in the programme and it is important that practitioners adhere to it if they want to compare the results and impact of their programmes across institutional and national borders.

Tab. 1: Names used for SI programmes at Higher Education Institutes (HEIs) in Europe

	SI (Supplemental Instruction)	PASS (Peer-Assisted Study Sessions/Schemes)	PAL (Peer-Assisted Learning)	Other
% of HEIs	34%	28%	28%	10%

3.3 Reasons for Introducing an SI Programme

In total, 44 HEIs responding to the second survey gave reasons for introducing SI. The main themes for these are given in Table 2. The original goal for SI in the US was mainly quantitative – to increase student performance and decrease student dropout. In Europe it appears that both qualitative and quantitative goals are common. For instance, helping the transition to university for new students as well as enhancing the student experience and engagement in general are pronounced goals besides increasing student performance and retention. In the category 'other', the results are mixed, with two minor themes on a small scale: provide older students with leadership experience and decrease student dropout in general.

Tab. 2: Reasons for starting SI programme at HEIs in Europe. Some of the responses span more than one theme.

	Aiding transition to HE/support for new students	Enhancing student experience/engagement in general	Increase student performance/retention in critical or 'difficult' courses/modules	Other
% of HEIs	41%	27%	45%	30%

3.4 Current Goals for the SI Programmes

Current goals for the SI programmes are diverse. The main themes for current goals are given in Table 3. The original quantitative goals for having SI (i.e. student performance and retention) are still important goals for several HEIs. Qualitative goals, like

aiding transition to HE and enhancing student experience/engagement that in many cases were the reasons for introducing SI in the first place, are still current goals for the SI programmes, although to a lesser extent. Approximately 40% of the HEIs have the goal of expanding the programme, which indicates that they are satisfied with what the SI programme provides the HEI. Among the several other stated current goals for SI, we find increasing employability for students that are leaders, giving new students general study strategies and skills that spill over to other non-SI supported courses, and sustaining and improving their current SI programmes.

Tab. 3: Current goals with SI programmes at HEIs in Europe. Some of the responses span more than one theme.

	Increase student retention/ performance	Expand the SI programmes	Aid transition to HE	Improve student experience/ engagement	Other
% of HEIs	49%	41%	21%	33%	41%

3.5 Subjects Supported by SI

SI was not developed with a particular subject in mind and should thus be applicable to all subjects. However, what does it look like in practice in Europe? Which subjects are commonly attached to SI? Since there are numerous subjects that are applicable, making it hard to get an overview, we have aggregated subjects into the following areas:

- Business/Economics,
- Education,
- Humanities,
- Law,
- Medicine and Health,
- Social Sciences,
- Sports,
- STEM (Science, Technology, Engineering, and Mathematics),
- Arts and Design, and
- Music.

The percentage of HEIs having SI within each subject area is given in Table 4. The most common subject area to apply SI is STEM. Medicine and Health, Business/Economics, Humanities, and Social Sciences are also popular for utilising SI, while SI in Arts and Design, Sports, and Music occur less frequently. It is somewhat surprising that courses in the subject area of Education are so rarely supported by SI. It seems like an appropriate area to apply SI, but perhaps courses in the subject are not perceived as 'difficult' or pedagogy-based on discussions is uncommon.

Tab. 4: Percentage of HEIs having SI support in the subject area. *(N = 62)*

Subject area	Percentage of HEIs having SI support in the subject areas
Business/Economics	45%
Education	16%
Humanities	45%
Law	24%
Medicine and *Health*	45%
Social Sciences	50%
Sports	19%
STEM Subjects	73%
Arts and *Design*	19%
Music	6%

3.6 Size of SI Programmes

A measure of the size of the SI programmes in Europe (see Figures 2–4) can be obtained from the number of 1) courses supported, 2) SI leaders, and 3) active trained supervisors (by certified trainers). With regard to supported courses, almost half are relatively small with SI support in up to 10 courses, while there are just a few with extensive SI support of courses (50+). An average of 22 supported courses suggests that SI programmes in general are substantial. With respect to the number of leaders[2] within the SI programmes, about a fifth are small in size, with up to 10 leaders. Approximately a third of the SI programmes have large numbers of leaders (100+), which requires substantial support from the HEI. Figure 4 illustrates a potential weakness in some SI programmes. Almost a quarter of the programmes are only led by one trained supervisor, making them vulnerable if something happens to the supervisor. This is also illustrated by the fact that one programme does not have a trained supervisor in charge (perhaps due to sudden personnel changes and that the new person has not received training yet). This is certainly not a good situation and may lead to decisions being taken that are not in agreement with the SI model due to the lack of knowledge about SI and the supervisor role.

2 In the comparison of the number of leaders between HEIs, one has to be aware that some HEIs use one leader per group and some use two. Some HEIs have leaders running multiple sessions and others do not – all of this impacts the number of leaders used. Paid vs voluntary positions when appointing leaders may also have an impact on the number of leaders.

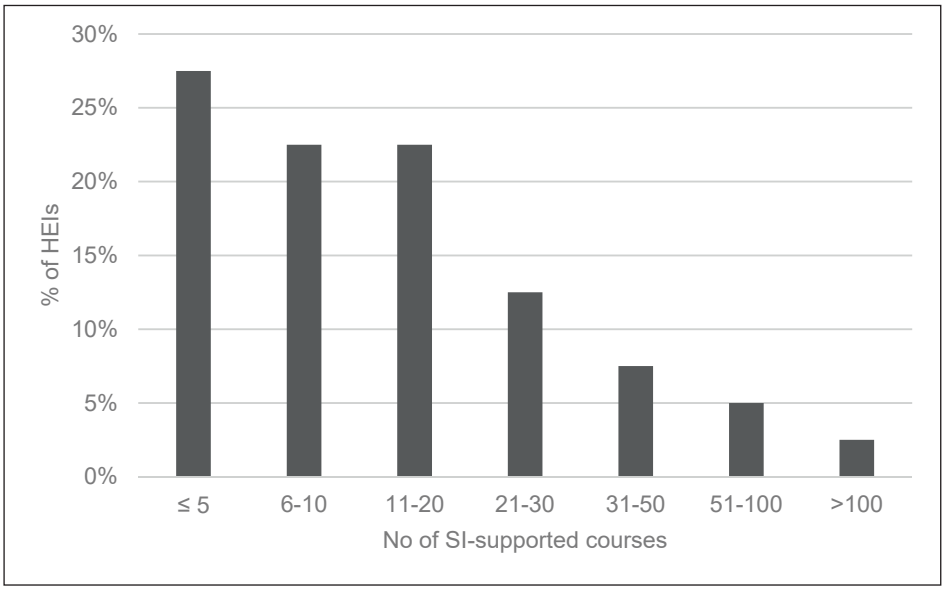

Fig. 2: Number of SI-supported courses at different HEIs in Europe *(N = 40)*

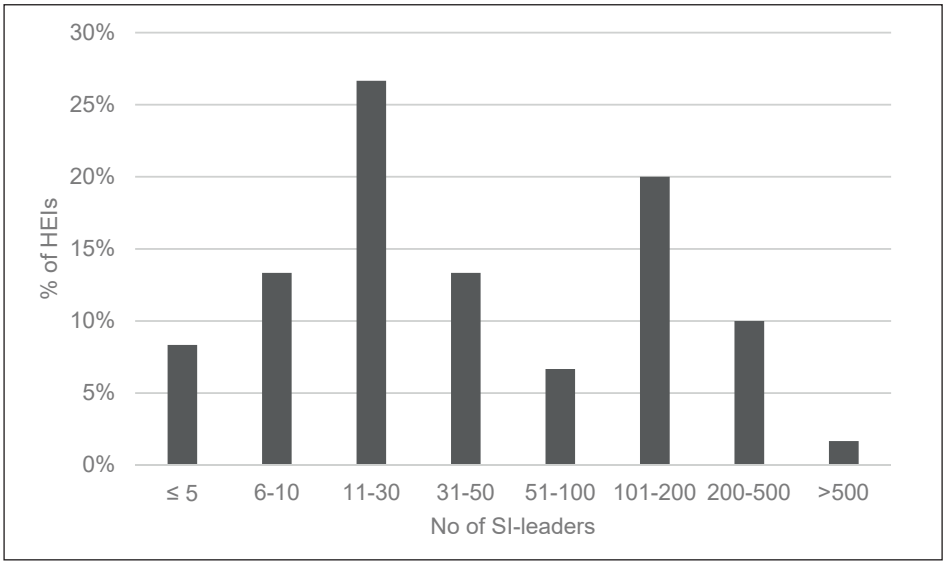

Fig. 3: Number of SI leaders at different HEIs in Europe *(N = 60)*

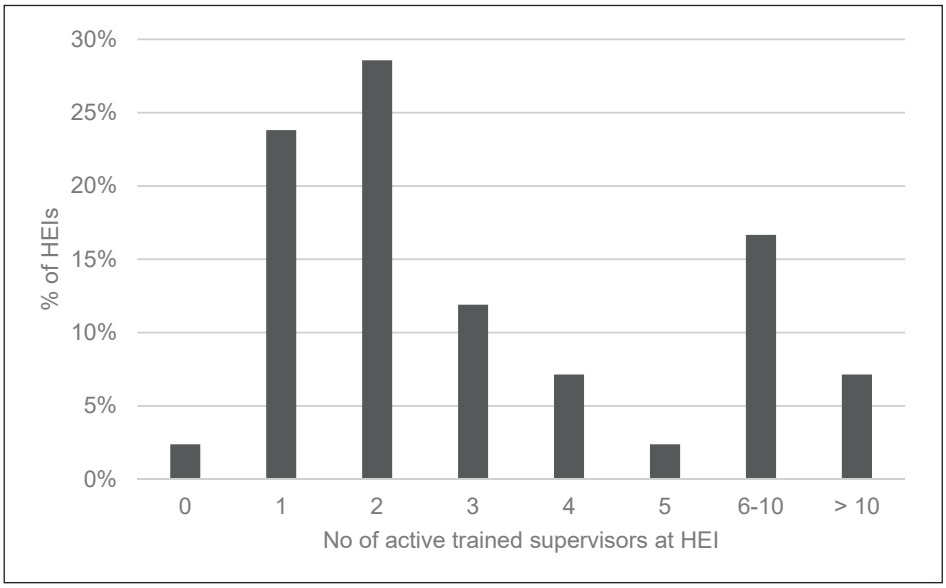

Fig. 4: Number of active trained supervisors at different HEIs in Europe at SI programmes *(N = 42)*

3.7 Attendance Statistics in SI Programmes

Average attendance statistics from HEIs answering the extended survey are presented in Table 5. About 2,000 students have access to SI at an average HEI and 57% used the service at least one time. The number of attendees at a session – about 10 – seems very appropriate for productive learning sessions using collaboration in small groups (see Fredriksson, Holmer, Malm, & Outtara, 2019 for more information on optimal attendance numbers). The workload of 15 meetings per year seems appropriate and not too taxing on the leaders. On average, there are about 100 leaders at an HEI with an SI programme. The majority of HEIs, primarily on the British Isles, have leaders working in pairs. In Scandinavia, it is more common to find leaders working alone. One-hour SI sessions are usually the standard. However, meetings lasting two hours occur frequently as well, particularly in STEM subjects. Based on items 3–7 in Table 5 it is possible to estimate the total number of hours that participants use the SI service for an HEI. In Australia, these are termed 'PASS contact hours'[3] and are used by Australian HEIs to provide senior staff/funders with an idea of SI usage. For an average HEI in Europe, we estimate the 'PASS contact hours' to be ~9,900 hours. If we assume

3 Contact hours per year can be estimated by multiplying the average number of attendees at an SI session (item 3 in Table 5) with the number of sessions given by a leader per year (item 4) and the total number of leaders per year at the HEI (item 5). The resulting number is multiplied with the average session length in hours (item 7) and divided by the average number of leaders per session (item 6).

that students are assigned to an SI group (attendance being voluntary), which often is the case, we can estimate an average SI attendance based on items 1, 3, 5, and 6 in Table 5. The average attendance for an HEI then becomes ~29% (i.e. almost a third of all students with access to SI attend their meetings each week).

Tab. 5: Average attendance statistics for SI programmes in Europe. The number of HEIs providing information regarding each statistical category is also provided.

			No. of HEIs providing information
1	How many students per year have access to SI?	1,879	34
2	How many students participate at least one time in SI per year?	1,078	27
3	How many attendees are there on average in your SI sessions?	9.8	30
4	How many SI sessions does a leader have on average per year?	15	38
5	How many leaders are carrying out the role on average per year?	96	59
6	Number of leaders per SI session?	1.7	58
7	How long (in hours) is an average SI/PASS/PAL session?	1.2	43
8	How many contact hours do you have in total per year for your students at SI/PASS/PAL? (Calculated based on items 3, 4, 5, 6, and 7 for each HEI)	9,900	31

3.8 Training and Ongoing Support of SI Leaders

One of the essential parts in an SI programme is the training and supervision of SI leaders. The recommended length of the initial SI leader training is a minimum of two full days (although it can be given as separate parts). The training usually includes understanding the SI model, group management, learning activities, and practical training. The recommended ongoing training commonly consists of two parts:

- supervisor observations of SI sessions with feedback to the leader, and
- debriefs or supervision meetings.

In debriefs or supervision meetings, a group of leaders meets and talks with each other about their experiences, solves challenges together, and shares good examples under the guidance of a supervisor. Debriefs or supervision meetings should be scheduled regularly (every week, every other week). In the original SI model, observations should be made regularly, starting from the first meeting, with higher frequency initially. Over the years this has been adapted in Europe to start in Week 3 to allow the leaders to build confidence and the group to form. Such an extensive observation scheme is seldom possible for most HEIs due to a lack of funds and supervisors and is therefore commonly reduced in size. Both debriefs/supervision meetings and observations may be adapted and changed slightly at each HEI. For instance, the observations may be done by trained peers to reduce costs and give students more responsibility. There might also be add-ons

created at the HEI to further help the ongoing training of leaders. One such example is reflective reports by the leaders after each SI meeting.

How does the initial training and ongoing support of SI leaders look in practice in Europe? If we look at the length of the initial training for SI leaders before they start their work, the most common is two days (see Table 6). A few are more ambitious, with one university providing a 15-week course for SI leaders. Almost half of the HEIs have a shorter training than the recommended two-day format, which causes some concern for the quality assurance of the programme as well as the support provided to leaders. However, anecdotally we know that many schemes, whilst reporting to deliver less than two days of training, provide further training in their first few weeks as a leader through extended debriefs. When mentioned, it seems like the training often is split into 50% content and 50% practical training, we would expect that more of the training should be focussed on experiential practical training, and again this may be delivered through content design.

Tab. 6: Number of days of initial training for SI leaders (rounded to the nearest half-day) before starting their job *(N = 63)*

Number of days of initial training	Percentage of HEIs
0.5 days	8%
1 day	24%
1.5 days	13%
2 days	46%
2.5 days	3%
3 days	5%
More than 3 days	2%

HEI responses as to the ongoing support for SI leaders indicated that, once they started their job, they express great creativity in addressing the issue. The presented support falls within the following nine categories:

1. *Observations with feedback.*
2. *Group meetings (a group of SI leaders and resource persons, such as the supervisor, senior SI leader, academic contact).* Examples: Supervision meetings; debriefs; catch-ups; meetings reflecting on evaluations; forums.
3. *One-on-one meetings (SI leader and supervisor/SI team member).* Examples: One-to-one support; individual coaching; one-to-one debriefs after each session; assistance with session planning.
4. *Developmental activities for SI leaders.* Examples: Supplementary training; optional advanced training; careers training; thematic meetings regarding special issues; additional workshops; social event/team building.
5. *Reflective practice for SI leaders with feedback.* Examples: Reflective weekly reports; reflective diary; e-portfolio over role; regular correspondence with SI team.

6. *Easy access to contact persons and material resources for SI leaders.* Examples: academic contact person (about material); senior SI leaders; PASS alumni network; open door policy to supervisors; drop-in services.
7. *Online resources.* Examples: VLE (Virtual Learning Environment); other online learning platforms.
8. *Internet support groups.* Examples: Facebook groups; other networks for leaders.
9. *Recognition activities.* Examples: Celebration event/awards; inclusion of SI leadership on degree transcript.

The frequency with which these are used is shown in Table 7. The most common ongoing support for leaders is debriefs or supervision meetings in groups, focusing on sharing experiences, challenges, and good examples. In rare cases, debriefs are done in a one-to-one format with a supervisor or senior SI leader in a supervisor role. Almost all HEIs use this type of debriefing support. Observations with feedback are also common, but about a third of the HEIs do not mention this as a support mechanism within their SI programme. That may be a bit alarming since it is supposed to be a cornerstone both in ongoing support to leaders and as quality assurance of the SI programme. Perhaps it is due to a lack of monetary and/or personnel resources. Several HEIs that use observations limit them to once a semester or once per course/module. The other types of ongoing support for leaders are not as pronounced, which might be partly due to the fact that they were forgotten in the free-text survey responses. However, they may serve as an inspiration to further develop the ongoing support to leaders. An interesting note from the responses is that many HEIs use senior SI leaders as resources within their SI teams. Typical tasks are observations with feedback, debrief meetings, one-to-one support, and being involved in training and developmental activities and administrative duties.

Tab. 7: Types of ongoing support for SI leaders and how frequently they are used according to survey responses from 61 HEIs. The number of HEIs using the type of support is given within parenthesis.

Type of ongoing support for SI leaders	Percentage of HEIs having this type of support
Observations with feedback	66%
Group meetings	89%
One-on-one meetings	11%
Developmental activities	26%
Reflective practice with feedback	20%
Easy access to contact persons and *material*	25%
Online resources	21%
Internet support groups	10%
Recognition activities	7%

3.9 How is the Success of the SI Programmes Monitored?

This survey question focuses primarily on the type of actions that are taken to monitor the SI programme. The results with respect to qualitative and quantitative dimensions are given in Tables 8–9. Since the survey question was open-ended, some actions may have been forgotten or taken for granted (and thus not mentioned). Therefore, the results in the tables are likely underestimated to some extent. Qualitatively, the SI programme is primarily monitored via questionnaires to SI attendees and by debrief/supervision meetings, observations, and questionnaires for SI leaders. Other monitoring methods exist for these two groups, including focus groups and interviews, but only to a lesser extent (likely due to these methods requiring more resources).

Tab. 8: Frequency in collecting types of quantitative data in the monitoring process of SI programmes *(N = 58)*

Group monitored	Type of data collected	% of HEIs using type of monitoring
Students in course	Attendance	47%
	Student performance	28%
	Student retention	5%
	Student attainment pre and post SI initiative	5%

Tab. 9: Frequency of methods used in the qualitative monitoring process of SI programmes *(N = 58)*

Group monitored	Method used	% of HEIs using monitoring method
Students not participating in SI	Questionnaires	5%
SI participants	Questionnaires	72%
	Interviews	3%
	Focus groups	16%
	Course evaluation	7%
SI leaders	Questionnaires	64%
	Interviews	5%
	Focus groups	14%
	Debriefs/supervision meetings	89%
	Observations	66%
	Reflective reports/diaries/testimonials	20%
Academic staff	Questionnaires/interviews/meetings	16%
SI programme staff	Formulation and evaluation of yearly action plans	5%
Alumni *leaders*	Questionnaires	5%

A complementary qualitative method – reflective reports/diaries/testimonials for SI leaders – is common in the Scandinavian countries but not as much in the British Isles. This may be because SI leaders in Scandinavia commonly are paid for their work. Consequently, more can be required of them. Two sources for feedback on the SI programme – academic staff and alumni leaders – are seldom used. These sources could be paths to obtain more varied information for the programme evaluation. It seems that a majority of the SI programmes at HEIs do not collect quantitative data, not even SI attendance data. This is a bit surprising since such data can be effective in obtaining continued funding as well as buy-in from students and academic staff. Perhaps the new data legislation in Europe discourages people from storing data on attendance and student attainment. This is an area to look into since quantitative data should be an important part of an SI programme evaluation.

3.10 Examples from the HEIs on the Difference their SI Programmes Make

The intention for including this open-ended question on the extended survey was to receive concrete examples of the differences that SI can make. Several of the 36 responses were very general and not well substantiated. Some examples include:

- Improves retention and engagement – a number of students would have withdrawn had they not attended SI. (University in Wales)
- Level of attendance at SI impacts positively on students' perceived preparedness and performance in end-of-year assessments. Students who attended half or more of the timetabled SI sessions believe they are better prepared for, and perform better in, their end-of-year assessments. (University in Southern England)
- We can see that some study groups that are formed during SI continue to work together for the whole education. (University in central Sweden)

Most substantiated examples were qualitative and based on questionnaires, focus groups, or interviews with participants, leaders, and academic staff. A few quotes are given below to illustrate this (in some quotes the local SI name has been replaced with SI for uniformity):

- The SI sessions have really helped me to consolidate my understanding of the lecture content and I have appreciated having extra support whenever I have had problems with the work. (Year 1 student, University in Northern England)
- SI eases some of my course stress by answering my questions and giving me an idea of what will be expected of me, not only in the coming weeks but in the future as well. (Student, University in Southern England)
- As student and then as a leader, the SI Programme helped me gain confidence in myself and instilled a sense of pride in college. (Applied Social Studies SI Leader, Institute of Technology in Ireland)
- Most leaders were not the same people they once were before joining SI. (SI Leader, University in Scotland)

- When I started job applications and interviews, being an SI Leader made me stand out from the crowd! (Maths SI Leader, University in Northern England)
- The SI scheme in Mathematics has been beneficial for all involved: academics, first-year students, and SI leaders. Students are free to explore Mathematics in a more open and non-judgemental environment and to find a sense of community with their peers and peer leaders. Peer leaders develop communication and leadership skills and get a sense of accomplishment and of 'giving back'. As an academic, having peer debriefs with my leaders gave me an insight into student issues that I might not discover through traditional lectures or tutorials. (Lecturer in Mathematics at University in Southern England).

Finally, there were a few survey responses illustrating quantitative differences that SI can make. Here are some examples:

- In 2016/17, 91% of SI leaders believed that SI has improved their leadership skills, while 88% believed SI helped them to improve their communication skills. In addition, 92% of SI leaders stated they could apply the skills they learnt from SI to real-world situations. (University in Southern England)
- In the initial year that SI was introduced as a mechanism of providing additional support to MSc Public Health and MSc Nursing students, the end-of-year module marks for the project module increased by an average of 10% across the cohort. (University in Northern England)
- Our research on SI in 2017 showed that the students who attended six SI meetings or more got the grades A, B, or C at their exam in Physics. The students who attended five or fewer meetings, or did not attend at all, got the grades between A and F. Half of those who earned an F did not attend any SI meetings. (University in Norway)

Results from the first calculus exam for engineering students vs SI attendance are given in Figure 5 (from Lund University, Sweden, after Malm, Bryngfors, & Mörner, 2011). The students had access to seven 2-hour SI meetings before the exam. The data are from approximately 760 students, with attendance relatively evenly spread between the attendance numbers on the horizontal axis.

From the above responses we can thus conclude that many HEIs continuously evaluate the outcomes from their SI programme to some extent. The given examples also illustrate the variety of ways SI can make an impact.

4. Conclusions

Based on the quantitative data presented above, we can make rough estimates of some key numbers for SI in Europe today (based on calculated averages multiplied with number of HEIs with active SI programmes):

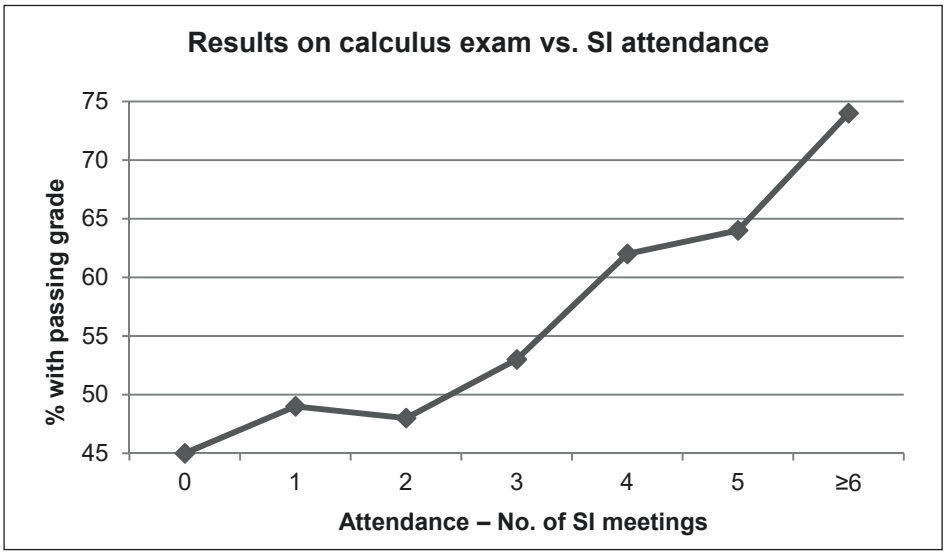

Fig. 5: Results on calculus exam vs. SI attendance

- 73 HEIs have active SI programmes;
- ~285 active supervisors lead the programmes;
- 1,480 courses/modules are supported annually with SI;
- 7,000 SI leaders are employed each year;
- 79,000 students participate in SI each year; and
- 784,000 contact hours are held per year for students attending SI.

Thus, it may be concluded that the usage of SI is substantial. What obviously can be improved upon is the geographical distribution of SI programmes within Europe. The goals of SI – to increase student performance and retention, aid transition to HE, and improve student engagement – are of interest to any HEI.

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Appendix

Basic Survey

Questions:

- How long have you been running SI-PASS?
- What subjects do you run SI-PASS in?
- How many SI-PASS Leaders do you have (per academic year)?
- How long is the training for SI-PASS leaders?
- How do you support the Leaders?
- Are the Leaders paid?
- Do the Leaders work alone or in pairs?
- How do you monitor the success of the SI-PASS programme?
- Contact details (to get in touch with supervisors in your SI-PASS programme).

Extended survey

Questions:

- What is the name of your programme?
- What was the main reason for introducing SI/PASS/PAL at the beginning?
- Could you give a short history of your SI/PASS/PAL programme?
- What goals do your Higher Education Institute have with SI/PASS/PAL today?
- How many courses per year have SI/PASS/PAL?
- How many trained supervisors are there at your HEI?
- Example of the difference the SI/PASS/PAL programme makes?
- Publications about SI/PASS/PAL programme?

Attendance Statistics

- How many students per year have access to SI/PASS/PAL?
- How many students participate at least one time in SI/PASS/PAL per year?
- How many attendees are there on average in your SI/PASS/PAL sessions?
- How many SI/PASS/PAL sessions do a Leader have on average per year?
- How long (in hours) is an average SI/PASS/PAL session?
- How many contact hours do you have in total per year for your students at SI/PASS/PAL?

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