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

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

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).

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

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.

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

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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