

# **A stakeholder analysis of an educational policy reform: The transition from Technical College Graduate to Bachelor of Science in Engineering in Sweden**

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## **Abstract**

In the early 1990s, the lower engineering degree in Sweden was transformed into a two-year engineering degree at the higher education level. This profound educational policy reform was preceded by more than ten years of investigations and preparations, with contributions from various stakeholders. With this policy reform, Sweden took its place alongside many other countries that had already implemented similar reforms to elevate what had traditionally been their more practically oriented engineering education. By using an oral history approach, i.e., a combination of historical text studies and interviews, this study explores the events leading up to the decision to enact this educational transformation. The focus is on the stakeholders involved and the roles they played. A division of the decision-making process into three phases shows how different stakeholders were more active in different phases. We conclude that it is not possible to identify any single stakeholder as more important than the others in this decision-making process, nor is there a single argument or single event that is decisive. Different proposals were tested and scrutinized, and by being an active part in the discussion, a final proposal with broad support from many stakeholders eventually emerged.

**Keywords:** engineering education, higher education, stakeholder analysis, educational policy reform, critical juncture

## Introduction

At the beginning of December 2009, the Swedish Minister of Education held a press conference in which he presented the idea of reintroducing the engineering education degree at upper secondary school level, which had ceased to exist at that level in the Swedish educational system some twenty years earlier. By his side at the press conference was the CEO of a large truck company who also was the chairman of the largest industry association in Sweden. He confirmed that industry welcomed this initiative because it saw a great need for engineers with this degree. The Minister of Education also remarked that it had been a mistake to abolish the shorter engineering education degree in the early 1990s.<sup>1</sup>

The main theme explored in this paper is the engineering education degree in upper secondary schools that was abolished in the early 1990s. The Technical College Graduate program (commonly and henceforth called T4, in Swedish also called *gymnasieingenjör*) was a more practically oriented engineering education than the engineering education at the tertiary level and had a history going back to the 19th century. From the mid-20th century, it became integrated into upper secondary schools as a three-year technical program, followed by an optional fourth vocational year (hence T4). The T4 program saw an increased number of new students throughout the 1970s and early 1980s, from 6,260 new students in 1973 to 12,490 new students in 1984.<sup>2</sup> Furthermore, the proportion of female students steadily increased, from merely 5 percent in 1973 to 22 percent in 1984.<sup>3</sup>

Despite the increased popularity of T4, after more than ten years of investigations, debates, and preparations, with contributions from various stakeholders, in the early 1990s it was transformed into a two-year engineering degree at the higher education level, later to become the still-existing three-year Bachelor of Science in Engineering. With this policy reform, Sweden took its place alongside many other countries that had already implemented similar reforms to elevate their domestic, traditionally more practically oriented, engineering education.<sup>4</sup> Two big differences can be noted about the Swedish reform, however: first, that it was carried out 20–30 years after that in similar countries, and second, that in the end a dual engineering education system was established within a seemingly uniform higher education system.<sup>5</sup>

Earlier descriptions of the policy reform have emphasized different reasons for it, often summed up as a combination of quality issues with T4 at the upper secondary school level, a need for a higher level of skills in industry, and a need for Swedish engineering degrees to become more aligned with the international arena of engineering degrees.<sup>6</sup> The authors of these analyses did not identify one single stakeholder as more influential than any other in the process, although the most prominent arguments are supposed to have originated from industry.

This was not a new call from industry or society concerning the need for change in engineering education. Since the start of the first engineering program, society had been trying to change and develop engineering education. On the other hand, the educational institutions have shaped and developed engineers, and thus have changed society. Jørgensen claims that engineering education has been quite resistant to change, even surprisingly resistant, at least during recent decades.<sup>7</sup> He notes that ‘when engaging in the reform of engineering education, it is important to understand its historical context’.<sup>8</sup> A Swedish essay by Lindqvist supplements this but also states that engineering education has always been slow to change, and that one reason is that while engineering educational institutions follow the development of the industry, they are always lagging by 10–20 years behind developments in industry.<sup>9</sup> Furthermore, the result of a particular development in engineering education can be short-lived or lasting, as identified by Graham.<sup>10</sup> For example, the durability of a change in engineering education is dependent upon the rationales for the development and the political/academic leadership of the development.

This Swedish engineering education development case, represented by the abolition of T4 in upper secondary schools and the introduction of a two-year engineering degree at tertiary level, is an example of an institutional change process in which the ‘visible’ change can be described as a critical juncture.<sup>11</sup> The process leading to the critical juncture is presumed to be filled with an incremental development of proposals for the policy reform, in which different stakeholders network, bargain, and interact while grinding and honing their arguments.<sup>12</sup> The critical juncture may be defined as the decision in the Swedish Parliament in 1989 to enact the policy reform, but the steps leading to it and the stakeholders involved in it need to be unpacked.

The research goal of this study is to understand the roles—that is, the positions, interests, influences, interrelations, and other characteristics—that different stakeholders took with regard to this issue, as well as the kinds of changes in position they made during the studied timeframe. In terms of research methodology, the study takes on the challenge posed by scholars to combine historical research with organizational studies in an improved manner.<sup>13</sup> It does so by applying an oral history approach,<sup>14</sup> that is, a combination of historical text studies<sup>15</sup> and semi-structured elite interviews.<sup>16</sup>

## Theoretical Framework

Taking a historical institutionalism<sup>17</sup> perspective, and using arguments from theories about institutional continuity and change,<sup>18</sup> the decision-making process leading to the critical juncture, is presumed to be filled with incremental steps. The critical juncture, the decision in the Swedish Parliament to adopt the proposal to transform the lower level engineering degree into tertiary level, may be well defined, but the actors and their arguments behind it are not. The steps towards the decision is a development process in which different stakeholders network, bargain, and interact while grinding and honing their arguments. As such, we focus our attention on the stakeholders involved in the process.

The importance of interest groups in decision-making processes and the need to characterize these ‘relevant actors’ in terms of their behavior, interests, agendas, influence, etc., have long been of interest to policy analysts.<sup>19</sup> A descriptive stakeholder analysis provides a conceptual language for the description, explanation, and analysis of these stakeholder relationships.<sup>20</sup> A stakeholder can be defined in many ways, depending on a broad or a narrow view of the subject of study, such as a firm, a higher education institution, or a health policy.<sup>21</sup> A broad definition, here represented by Freeman, states that ‘A stakeholder in an organization is (by definition) any group or individual who can affect or is affected by the achievement of an organization’s objectives.’<sup>22</sup> In other words, virtually anyone is a possible stakeholder. A narrower definition states that to have a stake in something, you must put something at risk.<sup>23</sup>

By taking a model and typology from Mitchell, Agle, and Wood, Jongbloed, Enders, and Salerno present a model for stakeholder analysis in

which stakeholders in higher education are identified and their key attributes are evaluated and interpreted.<sup>24</sup> This provides an approach that helps to identify ‘who or what really counts’.<sup>25</sup> Three main attributes are identified in this theory of stakeholder salience:<sup>26</sup>

- (1) Power: The stakeholder’s power to influence a certain matter.
- (2) Legitimacy: The degree to which the actions or claims of a stakeholder are seen as desirable, proper, or appropriate.
- (3) Urgency: The degree to which a stakeholder’s claims call for immediate action.

From these attributes, different classes of stakeholder can be identified, based on whether they possess one, two, or all three of the attributes. The salience is positively related to the cumulative perceived presence of the three attributes. Notably, the three attributes are not static and thus can change over time.

Urgency is an attribute apparently developed by the authors, which makes the model of Mitchell, Agle, and Wood unique because it combines the three attributes into a dynamic model for stakeholder analysis. While urgency is not defined much beyond the short explanation above, there is actually a need to elaborate on it a little more. It makes sense to presume that urgency is often ‘positive,’ as when a stakeholder urges an action of some kind. However, a stakeholder can also, presumably, urge that something not happen, i.e., a ‘negative’ urgency. It is appropriate to compare this with how an organization, or stakeholder, can respond when faced with pressure to change.<sup>27</sup> The response strategies represent the possible choices a stakeholder can make, in an active or passive way, and the attitude it takes, whether positive or negative.<sup>28</sup> This will be taken into account in the following analysis. Furthermore, and of note, is the fact that urgency is an attribute that the stakeholder can control, presumably more so than its complementing attributes of power and legitimacy.

Power and legitimacy are more established concepts, although often debated, and they are used in combination (or, in fact, as competing attributes) in other models of stakeholder analysis.<sup>29</sup> Definitions of power can focus on the agents and their different dimensions<sup>30</sup> or the places where power is exercised.<sup>31</sup> In either case, a definition of power most often includes the idea that one actor does something it would not have done if

another actor had not intervened.<sup>32</sup> For this study, an important attribute of power is that it is said to be variable: it can be acquired as well as lost.

Power alone cannot fully explain the relationship between a stakeholder and the organization, however, be it a business firm or a higher education institution; there are stakeholders with no power who still matter to organizations and their managers. Legitimacy, on the other hand, is used as the main, and sometimes even as the sole, attribute in other models of stakeholder identification and analysis. For example, in institutional theories, organizational legitimacy is closely related to survival,<sup>33</sup> and ‘illegitimacy’ can, according to these theories, result in strong pressures to conform to accepted norms, thus making organizations more similar.<sup>34</sup>

Legitimacy is a concept used by many but defined by few, at least before Suchman dug deeper into the concept.<sup>35</sup> Building his definition on institutional theory,<sup>36</sup> among other theories, Suchman concluded that legitimacy is ‘a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed systems of norms, values, beliefs, and definitions’.<sup>37</sup> This definition is not easy to operationalize, but it implies that legitimacy can be defined and negotiated differently for different organizational settings, and, like power, it can change over time. However, emphasizing legitimacy while ignoring power can confuse the stakeholder identification process, because some highly legitimate stakeholders may have no power to influence the matter at hand.

To conclude, stakeholder analysis needs both power and legitimacy as attributes to assess the salience of the stakeholders. However, it is the introduction of urgency and the combination of power, legitimacy, and urgency that make the model of Mitchell, Agle, and Wood—and its adaptation for higher education—appealing to use for this study.<sup>38</sup> The addition of positive or negative urgency is a further refinement of the model.

The interrelations between stakeholders are not in focus in the model of Mitchell, Agle, and Wood, but there is a need to relate and, if appropriate, cluster stakeholders with the same characteristics for a better understanding of the dynamics of a change process. However important, as Brugha and Varvasovszky note, emphasis on the policy networks tends to diminish the policy-making process itself, and thus the different stakeholders.<sup>39</sup> Reed et

al. report three principal methods to analyze stakeholder relations: actor-linkage matrices, social network analysis, and knowledge mapping.<sup>40</sup> The latter two are said to be best used in combination and to benefit from a large group of stakeholders. By contrast, actor-linkage matrices, in their simplest version, only require stakeholders to be determined as, for example, conflicting, complementing, or cooperating and are feasible where the stakeholders are few.

By applying a stakeholder analysis on the decision-making political process we can hopefully both analyze the timing and sequence of the process, and also identify and assess the stakeholders involved in it. We may define the critical juncture of this educational policy reform as the decision in the Swedish Parliament in 1989, but it still remains to unpack the steps leading to this institutional change.

## Method

The method for the study is a combination of historical text studies and semi-structured elite interviews, i.e., an oral history approach.<sup>41</sup> The primary documents consist of reports, investigations, and bills published directly by the government or by governmental authorities. Additional reports from various stakeholders are also considered as primary documents (see Appendix 1 for a list of primary documents). Furthermore, six semi-structured elite interviews,<sup>42</sup> selected through snowball sampling,<sup>43</sup> have been undertaken with persons who had key roles in the preparation work as well as in the policy reform. The main themes for the interviews have been to validate the identification and classification of the stakeholders in the process and to help identify changes and movements in positions of the stakeholders during the timeframe of the study.

The use of oral sources in the form of interviews raises issues of both credibility and ethics,<sup>44</sup> not least because of the conflict between memory and documents, also known as the battle between memory and history.<sup>45</sup> All interviewees had key positions in their respective organizations, for example as civil servants, political and non-political, involved in the investigations and reports that eventually led to the reform or as a program manager at an upper secondary school who then moved to a technical university with the mission to organize and manage the new engineering education. However, we have promised the interviewees anonymity and therefore are unable to

go deeper into their backgrounds or identities; a number of ethical issues are thereby possibly solved,<sup>46</sup> but at the same time the interviewees' versions have largely been left untouched, perhaps undermining the study's reliability. Indeed, we have received some contradictory accounts on some topics, but that is somewhat expected given that it is approximately 30 years since the events occurred.<sup>47</sup> Furthermore, the possibility of finding a plethora of suitable persons to interview is, for natural reasons, very low.

A main theme of this study is a stakeholder analysis based on the written and oral sources. A stakeholder analysis can be carried out in many ways.<sup>48</sup> Our point of departure has been to try to understand the stances of the different stakeholders—and how these changed—in relation to a historical policy reform in the field of education. The stakeholder analysis process can be separated into three parts, somewhat overlapping each other.<sup>49</sup> The first part of the analysis in this study was to identify the stakeholders. The work of identifying stakeholders can be compared to snowball sampling; an identified stakeholder leads to one or more other stakeholders.<sup>50</sup> Both the primary documents and the interviews have been used to identify and verify new stakeholders. The second part of the stakeholder analysis was to classify each identified stakeholder on the basis of three attributes—power, legitimacy, and urgency<sup>51</sup>—to determine their importance for the reform's design. Again, both the written material and the interviews have been used to determine the different positions of the stakeholders. Discussions on this reform lasted for several years, from the mid-1970s to the decision in the Swedish Parliament in 1989. Several stakeholders changed positions during this period, which have also been included in the stakeholder analysis. The third part involved investigating the stakeholder relationships. We have chosen simplified actor-linkage matrices, in which the relationships between different stakeholders are determined in terms of conflict, cooperation, or complementarity.<sup>52</sup>

The primary documents raise a few methodological challenges.<sup>53</sup> One is that the documents in the form of position papers, reports, governmental bills, etc., have a top-down perspective in many respects, and it is highly likely that many of these documents had an agenda, open or hidden. While a biased agenda may also be a factor within the interviews, these can in fact be seen as a way to offset any biases in the documents,<sup>54</sup> or at least as a way to indicate possible biases in the documents. It might have been helpful to balance this top-down perspective with, for example, material from

discussions by teachers or students, or from organizations representing these groups, but unfortunately we have not been able to find any such documents.

## **Results**

The turn of events leading to the decision in 1989 to implement the policy reform on engineering education in Sweden are unfolded and distinguished in three phases in this section. The three phases are characterized by the active stakeholders and/or type of activities in each phase. There is, however, a slight overlap in time in each phase because we have found it more accurate to sort simultaneous events by their characteristics rather than by the exact time of the events. A majority of the stakeholders from that time are the same as today, although many of them have different names (see Table 1 for a list of the identified stakeholders and the abbreviations used in the analysis). The stakeholders are introduced and analyzed as they appear along the timeline, identified through the primary documents and the oral sources. For a list of all primary documents used in this study, see Appendix 1.

Table 1. List of identified stakeholders and abbreviations used in the analysis.

<b>NAME OF STAKEHOLDER</b>	<b>ABBREVIATION</b>	<b>COMMENTS</b>
Civilingenjörssförbundet (Swedish Association of Graduate Engineers)	CF	Trade union
Cities and counties		Local/regional politicians
Industriförbundet (Federation of Swedish Industries)		Employers' organization
Kungl. Ingenjörsvetenskapsakademien (Royal Swedish Academy of Engineering Sciences)	IVA	
Svenska Arbetsgivareföreningen (Swedish Employers Association)	SAF	Employers' organization
Skolöverstyrelsen (Swedish National Agency for Education)	SÖ	Government agency
T4 Convention		Umbrella organization for T4 schools
Technical universities		
Tjänstemännens Centralorganisation (Swedish Confederation of Professional Employees)	TCO	Trade union
Verkstadsföreningen (industrial workshop association)	VF	Employers' organization
Universitets- och högskoleämbetet (Swedish Higher Education Authority)	UHÄ 1976-1992	Government agency
Universitetskanslersämbetet (Swedish Higher Education Authority)	UKÄ 1964-1976	Government agency
University colleges		

In the stakeholder analysis, the Swedish government has been placed at the center as 'the one to influence.' That is true in the sense that it is the governing politicians who have to be influenced to affect their decisions on the reform. There are, of course, other parties and politicians as well, and they could possibly form a new category of stakeholder, perhaps even several categories of stakeholder. However, all of our informants assured us that there were in fact no disagreements between the different political

parties. In fact, the findings include several comments about a lack of interest from parties other than the leading party of the time, the Social Democratic Party. As individuals, a few politicians stood out, but more as dedicated individuals than as anything else. The Ministry of Finance was, and still is today, in the background, as a gatekeeper monitoring educational costs and ensuring that they did not increase. However, we have not treated it as a separate stakeholder.

First, a short note on the premises for the turn of the events. As we noted in the introduction, there was a steady increase in the number of students in T4 during the 1970s and early 1980s. As most T4 graduates were promptly employed, T4 was regarded as functioning well in relation to the labor market.<sup>55</sup> In short, it was a popular program for both students and employers. However, some stakeholders raised concerns about the increased number of students in the T4 program. Because the total number of students in science and technology-related programs in upper secondary schools did not increase in the same way, the natural science-related programs saw a decrease in enrolled students. This was a concern for universities with a student base traditionally stemming from the natural science programs; the growth of T4 could be seen as a threat to their recruitment of students. In the short run, it was a threat to the recruitment of students to science-related educational programs, including engineering master programs, but in the long run to the recruitment of researchers.<sup>56</sup>

Although unemployment among those with a T4 degree was low, some stakeholders also pointed out that there was great variety in the skills demanded in the labor market, which meant that many students emanating from T4 did not get qualified engineering jobs.<sup>57</sup> The increased number of students in T4 programs coincided in the beginning of the 1980s with a strengthening of the economy in Sweden, especially within industry. This, together with a generally improved business climate in key export countries and rapid technological development, led to an increase in industry's demand for labor, including engineers.<sup>58</sup> Another area for concern was the decreasing availability of skilled teachers for T4, preferably combining engineering work experience with a technical specialization (and a teaching degree). The combination of increased student numbers and an increase in the demand for labor, with prospective teachers preferring better-paid work than that available in schools, was not favorable. The call from industry for

more engineers equipped with a widened skillset meant that a review of engineering education was needed.

### ***Phase I: A Call for Action***

In 1974, the Swedish Higher Education Authority (UKÄ) had already suggested to the Swedish government that a new type of shorter engineering program should be established within the universities. One of the reasons for the proposal from the authority was that other countries had already implemented this type of reform. While the proposal was turned down by the government, this can still be considered the starting point for a period of investigations and discussions that lasted 15 years.

*'As early as 1974, we [UKÄ] had suggested [to the government] and had talked to industry and universities about the introduction of new, shorter, engineering programs at the university level.'*<sup>59</sup>

At a time when educational politics were centralized nationally, governmental agencies had a very strong position, at least in terms of legitimacy, within their respective fields. Apparently, the power of this stakeholder was not enough (at that time) to make things happen, nor was there sufficient urgency.

A few years later, engineering education was a topic for other stakeholders. In 1982, SAF, the Swedish Employers Association, presented a policy report.<sup>60</sup> It contained ambitious proposals for changes to the educational system, centered on technical and engineering education. One reason for the increased interest and awareness was a rapid increase in the demand for labor in Sweden, especially in industry, at the beginning of the 1980s. Several more reports were launched by different stakeholders, all characterized by representation from both sides of the labor market, i.e., employers' organizations and trade unions.<sup>61</sup> During the 1980s, there were two main stakeholders on the employers' side, the Swedish Employers Association (SAF) and the Federation of Swedish Industries (Industriförbundet). One member of both SAF and Industriförbundet that was prominent in the discussion about T4 was the industrial workshop association (Verkstadsföreningen, or VF). On the union side, TCO, the Swedish Confederation of Professional Employees, an umbrella

organization, was an active stakeholder. Another important trade union with an interest in engineering education was CF, the Swedish Association of Graduate Engineers. However, the largest blue-collar trade union, LO, the Swedish Trade Union Confederation, normally an active player in educational policy, was not active on this occasion, engineering education being somewhat outside of its main mission. LO is therefore treated henceforth as a non-stakeholder.

In these reports, the main issue was not about moving T4 from the upper secondary school to universities or university colleges but the imminent problem of finding technically skilled labor for industry with a higher quality or a different skillset than the existing engineering programs could offer. Having said that, one identified issue arising at the higher education level was the plethora of short technical courses, mainly in university colleges. Earlier, university colleges had few opportunities to offer technical courses in Sweden, but after the reform of the Swedish higher education system in 1977, this changed. University colleges, and to some extent universities, including the technical universities, started to offer one- or two-year technical courses, eventually in a significant volume. In 1985–86, these shorter technical and engineering courses had approximately 2,000 new students a year compared to about 4,000 in the master's programs.<sup>62</sup> However, it was difficult for external stakeholders, that is, employers and students-to-be, to obtain an overview and understand the range of technical courses. This issue was addressed in some of the reports and highlighted by the interviewees, e.g., *'There was a plethora of educational programs, making it difficult for the labor market to understand'*.<sup>63</sup>

The three employers' organizations— SAF, Industriförbundet, and VF— can be seen as a cluster. One reason is that they published a joint report on engineering education in 1985.<sup>64</sup> These three stakeholders, especially SAF, had both power and legitimacy but did not perhaps show a determined urgency for a change: *'SAF was highly conservative'*.<sup>65</sup>

While we have not clustered the two trade unions, TCO and CF, they clearly show some resemblance as stakeholders. In this study, TCO is considered to have had less power and legitimacy than SAF but still made important contributions during the process. It showed urgency in relation to the matter and, together with CF, urged discussion about the concept of engineering and engineers.<sup>66</sup> Members of the TCO (through the affiliated

SIF member union) came mainly from T4 programs, whereas members of CF were exclusively engineers trained at technical universities. As such, TCO called for a preserved or developed T4 and thus a possible higher status, while CF was more concerned with guarding the exclusive high status of the master's programs in engineering,<sup>67</sup> expressing a negative urgency for policy reform.

This phase in the turn of events was thus characterized by external stakeholders calling on the government to take some kind of action with regard to engineering education. The call for action was not uniform, as different ideas and proposals were presented.

### *Phase II: The Government Answers the Call*

In 1984 and 1985, the government initiated a number of investigative assignments, involving both upper secondary school-level and higher education institutions, in order to deal with the calls from the labor market described above. The results of these investigations were reported during 1985 and 1986.<sup>68</sup> In one investigation, an 'expert group' was commissioned to review shorter technical education, i.e., all post-secondary courses in the field of technology shorter than the four year (the master's programs in engineering were four years long at that time).<sup>69</sup> Two more assignments dealt with the above-mentioned non-transparent growth of shorter technical courses at higher education level and the lack of cooperation between upper secondary schools and the tertiary level, and between higher education institutions.<sup>70</sup>

One report that we have considered to be of special interest was made by IVA, the Royal Swedish Academy of Engineering Science, in 1985. IVA is an independent organization, its members being elected fellows mainly from academia and business. IVA promotes contact and exchange between business, research, and government, both in Sweden and internationally, on different matters.<sup>71</sup> IVA was commissioned by the Swedish government to investigate and address the issue of the growing demand for engineers and qualified technicians, and to determine whether it was intermittent or structural and thus persistent. As a stakeholder, IVA had, and still has, a close relationship with technical universities. Many of their members are researchers and lecturers in engineering sciences at universities; the rest, predominantly with some kind of industry-related occupation, mainly have

an educational background in engineering sciences at master's level or higher. We have found it proper to cluster the trade union CF with IVA and the technical universities. As a stakeholder, IVA resembles CF in several respects; there is a distinct connection between engineering research and master's programs in engineering at the university level and thus a close relationship with the technical universities. This assumption has also been confirmed in our interviews and in the reports by CF and IVA.<sup>72</sup>

With that in mind, it is not surprising that IVA began its investigation by interpreting and defining the assignment as analyzing the demand for 'engineers and qualified technicians' to mean only master's level education and postgraduates. However, the report eventually discussed T4 and shorter technical programs. Here, for the first time in the written documents, we can find outspoken criticism of the quality of T4. It is said (though without any references) that job opportunities varied greatly after taking the degree and that only a few obtained qualified engineering positions, while the majority obtained positions as, for example, technicians. Like other reports had hinted, IVA's proposed that T4 be extended by one year but *not transferred to the higher education level*. The proposal was to establish engineering schools such that upper secondary schools and higher education could meet with T4 from one side and the shorter technical courses from the other side, all within a self-contained organizational system. While not explicitly stated in the report, it is reasonable to think that the German *Fachhochschule* and/or other similar organizational arrangements in other countries served as role models for the proposal.

We have treated IVA as a key stakeholder in this process, at least in this phase. In terms of power, legitimacy, and urgency in these matters, IVA had substantial power, high legitimacy, and showed low, or even negative, urgency in relation to transforming the T4 degree into a university-level course. As such, it is possible that its high status as a stakeholder led to a delay in any reform transferring T4 to the university level, with IVA's proposal in the report of 1985 going in another direction. More to the point, the report, with its interpretation of the original assignment, may be regarded as a voice of resistance from the technical universities: a negative urgency.

It may be noted here that we have sorted higher education institutions into two separate stakeholder groups, the technical universities and the

small/new/regional university colleges. While there is no need to explain technical universities further, the group called small/new/regional university colleges may need some unfolding. Through a comprehensive reform of Swedish higher education in 1977, several new university colleges were created throughout the country. They usually had very limited activity in the field of technical education, although they were seeking opportunities in that area. The university colleges are not visible as stakeholders in their own right in this phase, although they will appear in the next phase.

One apparently unimportant investigation by the government, at least for shorter and longer technical education at the higher education level, was a review of the entire structure of upper secondary schools. One of the major proposals of the final report, presented at the beginning of 1986, was that all programs at the upper secondary school level should be three years long.<sup>73</sup> The main idea behind this proposal was to strengthen the theoretical elements in two-year-long (mainly) vocational programs. However, it obviously also had big implications for T4. Were this proposal to be realized, there would be no room left for T4 in upper secondary schools, and even less were it to be extended into a five-year-long engineering program.

*'Well, in my mind—and I am pretty sure about certain reasons—the proposal of a uniform length of three years in all programs at upper secondary school was one big reason. Achieving this would mean T4 simply not fitting in, so to speak.'*<sup>74</sup>

This phase was characterized by activity on the government's part, commissioning a handful of inquiries to obtain an overview of the situation and collect proposals for a solution. The assignments were given to different, mainly 'internal,' stakeholders, that is, national agencies, but also to IVA, an independent academy. The external stakeholders from the first phase, i.e., labor market actors such as SAF, VF, and TCO, were not visible in the reports from the national authorities in this phase: they were, for example, not (visibly) participants in expert groups or advisory boards. The exception was the report from IVA. Their main arguments were visible, however, and perhaps even more pronounced than in their own reports from the previous phase: quality issues within T4, the need for a different/higher skill level in industry and the need for a more internationally valid engineering education in Sweden.

One stakeholder indirectly visible in this phase was the T4 Convention. The upper secondary schools with T4 programs had an umbrella organization, called the T4 Convention. Naturally, they had an interest in any changes within T4. The teachers in these schools were organized in trade unions. However, we found no traces of contributions to the process on their part and consequently we have left them out of this stakeholder analysis. The same goes for the students and their organizations, from which we did not find any contributions. The T4 Convention was a stakeholder with a high legitimacy, less power (the real power being at the SÖ national agency and/or the local politicians), and, of course, a negative urgency with regard to the policy reform ideas of converting the T4 degree into a university degree, essentially dissolving the existence of the T4 Convention.<sup>75</sup> The T4 Convention did also advocate for the development of T4, but as a prolonged degree within upper secondary schools.

*'It was not like the T4 Convention was all that happy with the development of T4, but it was terrified that a vast reform would have a negative outcome on the recruitment of new students, not least because the number of female students had increased considerably in recent years.'*<sup>76</sup>

Another stakeholder at the same educational level as the T4 Convention but only indirectly visible in this phase was SÖ, the Swedish National Agency for Education. SÖ and the authority for higher education, UHÄ, both had very strong positions within their fields. Because they had opposite standpoints, the power balance between these two authorities is an important factor in this study. SÖ had an anti-reform approach, and UHÄ had a pro-reform approach. Furthermore, it is been clear from the interviews that while UHÄ, as the agency for higher education and research, had a very powerful role in higher education matters, it was less powerful than the SÖ in these matters.<sup>77</sup>

*'SÖ was strong and did not want any [changes] ... We, UHÄ, was a small player in this context, so we [SÖ and UHÄ] were, after all, very different.'*<sup>78</sup>

On the one hand, this meant that a stakeholder such as SÖ, with its 'negative urgency,' tried to prevent change. On the other hand, it meant that a group of stakeholders such as the universities, both the technical universities and the university colleges, were essentially non-stakeholders,

because the proposed changes would not affect them other than at the margins. While not being treated in this study as an alliance, SÖ and the T4 Convention used a valid argument for their ‘resistance’: the increased number of students in T4 over the preceding decade, and female students in particular.

### ***Phase III: Proposals, Initiatives, Negotiations, and Agreements***

In some of the reports in phase II, there were suggestions that T4 be reformed into an engineering program at the tertiary level. In this phase, this alternative becomes even more pronounced, perhaps not surprisingly after the governmental report about profound reforms of upper secondary schools.<sup>79</sup> Having said that, several reports wrote about the formation of engineering schools as a new type of higher education institution, separate from comprehensive universities and technical universities, and as something that may or may not be a reality in the future.<sup>80</sup> In fact, the largest technical university in Sweden, KTH Royal Institute of Technology, took some initiatives of its own. The Engineering School at KTH was established in July 1986, collecting all of the engineering and technical programs at KTH except the master’s programs.<sup>81</sup> KTH, being one of the technical universities in Sweden, was in this study initially assessed as a non-stakeholder and later, as seen above through the report by IVA,<sup>82</sup> a stakeholder with a negative stance. While this new initiative was more active and showed a seemingly positive approach, the fact that all educational activities within the new school were to be located off the main campus is noteworthy. In fact, it is relevant to ask if this strategy was also a way of protecting the perceived core business at the technical university. While the only evidence for resistance in this study is manifested through the report by IVA, all of the interviewees were very clear in their statements that the technical universities would have been more than happy for a prolonged or transformed T4 to be placed somewhere other than at technical universities. For example: ‘*The technical universities were only interested in the master’s programs. The other stuff could be handled by the small university colleges.*’,<sup>83</sup> and even: ‘*They weren’t ... in reality they wanted ... how shall I put it ... [they became] the involuntary education provider in these matters.*’<sup>84</sup>

Eventually, in early 1987, a new investigation was initiated by the government, this time with a special mission: to initiate a test operation whereby T4 in some cities was to be transferred to the local university or university college.<sup>85</sup> The signal from the government was clear: it was no longer a question of if T4 would be transferred to higher education level, but how. A key question for this investigation was to find an organizational and economic solution that could provide for both the transfer of T4 to the university level and its prolongation by one year. In reality, as one of the interviewees in this study put it, *'This was not an investigation, it was a negotiation'*.<sup>86</sup> With strong support from local/regional politicians, supplemented primarily by the university colleges, a solution was proposed in the final report, whereby buildings and equipment (essentially the T4 schools) for the new engineering program at university level were initially to be provided and funded by local cities/governments, while other educational costs were state funded.<sup>87</sup>

Cities and counties, represented by local/regional politicians, were stakeholders if they had either an upper secondary school with T4 programs or a higher education institution in their region. Their allies in this matter became the university colleges because they complemented each other, and during the latter part of the process they cooperated. The university colleges had less power and weaker legitimacy than the technical universities, but they also had a desire to expand in the field of technical higher education, and thus a strong and positive urgency. As mentioned earlier, there was no real political opposition in these matters. Our informants even witnessed of a lack of interest at the national political level. At the local/regional level, there seems to have been more interest, but again there was no opposition to the proposals for a reform. On the contrary, the cities, allied with the corresponding university colleges, were enthusiastically positive about the plans:

*'They were really interested, and I mean, when the university college was interested, so was the local government.'*<sup>88</sup>

The rationales for this can be summed up by the simple fact that the higher education institutions had a perceived higher status than did the upper secondary schools.

In the end, a group of stakeholders that were not visible in the earlier process, namely, the local/regional politicians, together with higher

education institutions, especially the university colleges, provided enough support to make the leading governmental politicians take the final step toward a policy reform of T4. A key stakeholder to convince, as always in political decisions, was the Ministry of Finance, because it always pays close attention to presumably costly reforms. The financial proposal (mentioned above) presented in the report in 1988,<sup>89</sup> together with a unified group of stakeholders, proved to be enough to convince the Ministry of Finance. In 1989, a bill from the Swedish government was presented with the intention of eventually transferring T4 to the university level and stating that the policy reform would be complete by 1993–94.<sup>90</sup> The Swedish Parliament voted accordingly on the bill in the spring of 1989.

The external stakeholders most active in the first phase, that is, the labor market actors such as SAF, VF, and TCO, were now represented in expert groups and/or on advisory boards. Hence, in this phase, they did not issue any new reports of their own, and their input into the process is thus not directly visible.

With the decision in the Swedish Parliament, this presentation of the turn of events ends. However interesting, the implementation of the reform is beyond the scope of this study.

## Discussion

The main research topic for this study has been to understand the roles (that is, the positions, interests, influences, interrelations, and other characteristics) taken by different stakeholders in the decision-making process that led to a profound policy reform for engineering education in Sweden. Using an oral history approach and combining historical institutionalism with stakeholder analysis, the turn of events from 1982 to 1989 have been analyzed. Furthermore, by separating the decision-making process into three phases, we have shown how different stakeholders were more active in different phases.

In the discussion of the stakeholder analysis in the theoretical framework, we introduced ‘negative urgency’ as an extension of the model of Mitchell, Agle, and Wood.<sup>91</sup> We claim that this refinement is necessary for a better understanding of the process and the stakeholders involved in it. Furthermore, we claim that the ‘urgency’ attribute is vital for the stakeholder analysis; assessing the attributes ‘legitimacy’ and ‘power,’

alone or in combination, would not have been enough to acquire a deep understanding.

Furthermore, we can confirm the findings of earlier literature on institutional change that small incremental developments can eventually lead to a critical juncture, and that the timing and sequence leading to this is characterized by different stakeholders involved in networks and interactions in order to hone the arguments.<sup>92</sup> To conclude: It is not possible to identify one particular stakeholder as being more important than anyone else in this decision-making process. Moreover, there is no single argument or single event that is decisive. Rather, it is a combination of various stakeholders that refine their arguments and grind away contradictions, perhaps even forming alliances, supplemented by events in the surrounding society, near and distant, that pushes the issue forward until it eventually tips over. This is not surprising, since ‘historical events always have multiple causes’.<sup>93</sup>

One take on this by the interviewees is that different proposals were tested and scrutinized by many stakeholders in different fora. By virtue of being an active part of the discussion, the final proposal eventually emerged and thus had broad support from many stakeholders. One sign of this is that after 1985, no stakeholder outside of the government or its agencies provided any new reports. Instead, many of the governmental investigations had ‘reference groups’ or ‘expert groups’ attached to them; these stakeholders were thereby involved in the discussions within these groups.

Another way of viewing the decision-making process is that several stakeholders altered their stance during the process. In the words of Oliver and Geschwind, they changed response strategies.<sup>94</sup> The most significant case is the way in which the technical universities, exemplified by KTH, acted and reacted. At first, as we have shown, the technical universities were more or less passive, taking neither a positive or negative stance, literally non-stakeholders. Later, in phase II, as seen in the report by IVA,<sup>95</sup> they took a more active and negative stance, trying to resist the policy reform. Then, as exemplified by the creation of the Engineering School at KTH, they turned around, became active, and tried to influence the turn of events. However, in the case of KTH, its strategy could also be seen as a way of preserving its organizational identity, which embraced master’s programs and research.<sup>96</sup>

We have in this study focused on the time before the actual implementation of the new engineering education. It would be interesting to try to determine why Sweden undertook this policy reform some 20–30 years after other comparable countries. Further studies could also examine how the implementation was handled and what effects it really had on the organizational identity of the technical universities. Moreover, the perspective of the upper secondary schools with T4 programs on this story would also be interesting to hear. They were clearly on the losing side of this, in the sense of a lost technical education with a long and quite successful history. Another topic also worth studying would be the reintroduction of T4 to upper secondary schools in 2011 and the rationale behind this educational reform coming full circle.

## Notes

1. This engineering degree was indeed re-introduced in 2011.
2. Utbildningsdepartementet, “En treårig yrkesutbildning,” 106.
3. Ibid.
4. Delahousse and Bomke, “Structural Transformations.”
5. Several European countries organized a dual education system for engineering education with, on the one hand, master programs at the university level and, on the other, more practically oriented engineering programs. The latter often had their own organizational forms, separate from the universities, such as Teknika (Denmark), Regional Technical Colleges (Ireland), and Universities of Applied Science (The Netherlands) (see Christensen and Newberry [2015] for more about the Danish, Irish, and Dutch examples).
6. See Lindskoug, “Från T4 till högskoleingenjörsutbildning,” Håstad, “Högskoleingenjörsutbildning,” and Svärd, “Högskoleingenjör 2001.”
7. Jørgensen, “Historical Accounts.”
8. Ibid., 216.
9. Lindqvist, “En sliten och alldeles.”
10. Graham, “Achieving Excellence.”
11. Thelen, “Historical Institutionalism.”
12. Thelen, “Historical Institutionalism”; and Mahoney and Thelen, “A Theory of Gradual.”
13. Rowlinson and Hassard, “Historical Neo-Institutionalism”; and Suddaby, Foster and Mills, “Historical Institutionalism.”

14. Thompson, *The Voice of the Past*; and Thomson, "Four Paradigm Transformations."
15. McCulloch, "Historical and Documentary Research."
16. Kvale and Brinkmann, *Interviews*.
17. Suddaby, Foster and Mills, "Historical Institutionalism."
18. Thelen, "Historical Institutionalism"; Pierson, "Not Just What, but When"; and Mahoney and Thelen, "A Theory of Gradual."
19. Brugha and Varvasovszky, "Stakeholder Analysis: A Review."
20. Donaldson and Preston, "The Stakeholder Theory."
21. See for instance Mitchell, Agle and Wood, "Toward a Theory of Stakeholder," 858, Table 1.
22. Freeman, *Strategic Management*, 46.
23. Clarkson, "A Risk Based Model," as cited in Mitchell, Agle and Wood, "Toward a Theory of Stakeholder."
24. Mitchell, Agle and Wood, "Toward a Theory of Stakeholder"; and Jongbloed, Enders and Salerno, "Higher Education and Its Communities."
25. Freeman, "The Politics of Stakeholder Theory," 411.
26. Mitchell, Agle and Wood, "Toward a Theory of Stakeholder," 869.
27. Oliver, "Strategic Responses."
28. Geschwind, "Getting Pole Position."
29. Mitchell, Agle and Wood, "Toward a Theory of Stakeholder."
30. Lukes, *Power: A Radical View*.
31. Foucault, *Essential Works of Foucault*.
32. Pfeffer, *Power in Organizations*.
33. Meyer and Rowan, "Institutional Organizations."
34. DiMaggio and Powell, "The Iron Cage Revisited."
35. Suchman, "Managing Legitimacy."
36. DiMaggio and Powell, "The Iron Cage Revisited."
37. Suchman, "Managing Legitimacy." 574.
38. Jongbloed, Enders and Salerno, "Higher Education and Its Communities."
39. Brugha and Varvasovszky, "Stakeholder Analysis."
40. Reed et al., "Who's In and Why?"
41. Thomson, "Four Paradigm Transformations"; Thompson, *The Voice of the Past*.

42. Kvale and Brinkmann, *Interviews*.
43. Patton, *Qualitative Research & Evaluation Methods*.
44. Thomson, "Four Paradigm Transformations."
45. Hoddeson, "The Conflict of Memories and Documents."
46. Kvale and Brinkmann, *Interviews*.
47. Hoddeson, "The Conflict of Memories and Documents."
48. See Brugha and Varvasovszky, "Stakeholder Analysis."
49. Reed et al., "Who's In and Why?"
50. Patton, *Qualitative Research & Evaluation Methods*.
51. Mitchell, Agle and Wood "Toward a Theory of Stakeholder."
52. Reed et al., "Who's In and Why?"
53. McCulloch, "Historical and Documentary Research."
54. Hoddeson, "The Conflict of Memories and Documents."
55. Utbildningsdepartementet, "En treårig yrkesutbildning," 115.
56. Interview #2.
57. IVA, "Ingenjörer för framtiden."
58. Feldt, *Alla dessa dagar*.
59. Interview #3.
60. SAF, "Den stora skolreformen."
61. SAF, Industriförbundet, and VF, "Var finns teknikerna för svensk industri?"; VF, "Verkstadsindustrins behov av ingenjörer,"; CF, "Sveriges civilingenjörersförbunds syn på utbildningsfrågor,"; TCO, "Tekniker,"; and SAF, "En svensk collegeskola."
62. Utbildningsdepartementet, "Kortare teknisk utbildning."
63. Interview #1.
64. SAF, Industriförbundet, and VF, "Var finns teknikerna för svensk industri?" 1985.
65. Interview #3.
66. Interview #2.
67. CF, "Sveriges civilingenjörersförbunds syn på utbildningsfrågor,"; Interview #1; and Interview #2.
68. IVA, "Ingenjörer för framtiden"; UHÄ and SÖ, "Ingenjör- och teknikerutbildningar i samverkan"; Utbildningsdepartementet, "Kortare teknisk utbildning"; Utbildningsdepartementet, "En treårig yrkesutbildning"; and UHÄ, "Stockholm - Uppsala."
69. Utbildningsdepartementet, "Kortare teknisk utbildning."

70. UHÄ, “Stockholm - Uppsala,”; and UHÄ and SÖ, “Ingenjör- och teknikerutbildningar i samverkan.”
71. <https://www.iva.se/en/About-IVA/what-is-iva/> Retrieved: 2020-04-26.
72. CF, “Sveriges civilingenjörersförbunds syn på utbildningsfrågor”; and IVA, “Ingenjörer för framtiden.”
73. Utbildningsdepartementet, “En treårig yrkesutbildning.”
74. Interview #1.
75. Interview #1; and Interview #4.
76. Interview #1.
77. Interview #2; and Interview #3.
78. Interview #3.
79. Ibid.
80. See SAF, “Den stora skolreformen”; SAF, “En svensk collegeskola”; IVA, “Ingenjörer för framtiden”; and UHÄ, “Stockholm - Uppsala.”
81. KTH, “Policy för utbyggnad.”
82. IVA, “Ingenjörer för framtiden.”
83. Interview #3.
84. Interview #2.
85. Utbildningsdepartementet, “Försök med samordnad ingenjörutbildning.”
86. Interview #4.
87. Utbildningsdepartementet, “Samordnad ingenjörutbildning på mellannivå.”
88. Interview #4.
89. Ibid.
90. Utbildningsdepartementet, “Regeringens proposition 1988/89:90.”
91. Mitchell, Agle and Wood, “Toward a Theory of Stakeholder.”
92. See Mahoney and Thelen, “A Theory of Gradual”; Thelen, “Historical Institutionalism”; and Pierson, “Not Just What, but When.”
93. Kieser, “Why Organization Theory,” 618.
94. Oliver, “Strategic Responses”; and Geschwind, “Getting Pole Position.”
95. IVA, “Ingenjörer för framtiden.”
96. Fagrell and Geschwind, “Engineering Academisation.”

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## Appendix 1. List of primary documents (chronologically)

REFERENCE (SHORT)	TYPE OF SOURCE	SHORT DESCRIPTION/TITLE
Utbildningsdepartementet, 1978	Government report	Inför 2000-talet: samhällets behov av naturvetare och tekniker
SAF, 1982	Policy report	Den stora skolreformen
VF, 1984	Policy report	Verkstadsindustrins behov av ingenjörer
CF, 1984	Policy report	Sveriges civilingenjörssförbunds syn på utbildningsfrågor
SAF, Industriförbundet & VF, 1985	Policy report	Var finns teknikerna för svensk industri?
Utbildningsdepartementet, 1985	Government report	Ds U 1985:11 Kortare teknisk utbildning: rapport från Expertgruppen för kortare teknisk utbildning
IVA, 1985	Policy report	IVA-meddelande 249: Ingenjörer för framtiden
TCO, 1985	Policy report	Tekniker: arbete och utbildning i framtiden
SAF, 1985	Policy report	En svensk collegeskola
Utbildningsdepartementet, 1986	Government report	SOU 1986:3 En treårig yrkesutbildning
UHÄ, 1986	Official report	UHÄ-rapport 1986:18 Stockholm - Uppsala: 14 högskolor i samverkan
UHÄ och SÖ, 1986	Official report	UHÄ-rapport 1986:16 Ingenjör- och teknikerutbildningar i samverkan

Utbildningsdepartementet, 1987	Government report	Ds U 1987:12 Försök med samordnad ingenjörutbildning på mellannivå: delrapport från Arbetsgruppen för samordnad ingenjörutbildning på mellannivå (SIM-gruppen)
Utbildningsdepartementet, 1988	Government report	Ds U 1988:20 Samordnad ingenjörutbildning på mellannivå
UHÄ, 1988	Official report	UHÄ-rapport 1988:4 Teknikerutbildning i högskolan
KTH, 1988	Policy report	Policy för utbyggnad av Ingenjörsskolan vid KTH
UHÄ, 1988	Official report	UHÄ-rapport 1988:15 Ny ingenjörutbildning
UHÄ, 1988	Official report	UHÄ-rapport 1988:8 Från ingenjör till civilingenjör
KTH, 1989	Policy report	Utvecklingsplan för 90-talet
UHÄ, 1989	Official report	UHÄ-rapport 1989:19 Ingenjörslinjerna i högskolan. Förslag till utbildningsstruktur
Sveriges Riksdag, 1989	Government bill	Proposition 1988/89:90 inkl Utbildningsutskottets betänkande och 3 motioner