The latent structure of educational offerings—tracing topics from folk high school catalogues through large-scale content analyses

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Abstract Program analysis has been developing into a prolific research tradition illustrating the utility of adult education providers and program descriptions as heuristic objects for addressing larger questions of social scientific and humanistic inquiry. In this research tradition, attention has been directed to the way programs and educational offers of adult education providers reflect the changing labour market, educational systems and cultural zeitgeist. In this article, we interrogate the opportunities to deploy large-scale text analysis on the content of the national catalogues of Swedish folk high schools (1954–2007) to further enlarge the analytical depth and precision of how program analysis can address changing educational offerings. Based on an analysis of a comprehensive digital repository we identify the latent thematic structures of educational offers in Swedish folk high schools over time and discuss how these changing course descriptions reflect broader structural changes in its educational system as well as regarding the purpose of adult education.

Keywords Program analysis · Topic modelling · Folk high school · Text analysis · Sociology of education
Die latente Struktur von Bildungsangeboten – Aufspüren von Themen aus Volkshochschulprogrammen durch großangelegte Textanalysen

**Zusammenfassung** Die Programmanalyse hat sich zu einer produktiven Forschungstradition entwickelt, die den Nutzen von Anbietern von Erwachsenenbildung und Programmbeschreibungen als heuristische Objekte zur Behandlung größerer Fragen sozialwissenschaftlicher und humanistischer Forschung veranschaulicht. In dieser Forschungstradition wurde die Aufmerksamkeit darauf gerichtet, wie Programme und Bildungsangebote von Erwachsenenbildungsanbietern den Wandel von Arbeitsmarkt, Bildungssystemen und kulturellem Zeitgeist widerspiegeln. In diesem Artikel untersuchen wir die Möglichkeiten, großangelegte Textanalysen des Inhalts der Programme der schwedischen Volkshochschulen (1954–2007) einzusetzen, um die analytische Tiefe und Genauigkeit der Programmanalyse für sich ändernde Bildungsangebote weiter zu erhöhen. Basierend auf einer Analyse eines umfassenden digitalen Repositoriums identifizieren wir die latenten thematischen Strukturen von Bildungsangeboten an schwedischen Volkshochschulen im Laufe der Zeit und diskutieren, wie diese sich ändernden Kursbeschreibungen breitere strukturelle Veränderungen im Bildungssystem sowie im Hinblick auf den Zweck der Erwachsenenbildung widerspiegeln.

**Schlüsselwörter** Programmanalyse · Topic Modelling · Volkshochschule · Textanalyse · Bildungsoziologie

1 Introduction

In the last few decades, an interesting set of methods and analytical tools have emerged at the crossroads of computational linguistics and the social science and humanities (SSH). In the US, the emergence of “big data” and the has even been declared “a watershed moment” for SSH as both the access to large-scale datasets and the analytical methods of computational linguistics are so rapidly evolving and expanding (McFarland et al. 2016). Computational linguistics and natural language techniques, such as topic modelling, has also fruitfully been advanced for deepening our understanding various educational phenomena such as the content of textbooks (Lachmann and Mitchell 2014; Lucy et al. 2020), spoken and written discourse among students (Crossley and Kyle 2018) or the topics that is addressed among educational researchers (Nylander et al. 2022; Nylander and Tan 2022).

The creation of large data repositories and the ongoing digitalization of various archival material makes large-scale text analysis particularly interesting for widening and deepening the methodological developments for content analysis and for understanding the topics and themes of educational programs (cf. Krippendorff 2019; Lucy et al. 2020). Through the digitalization of catalogues, books, programs, booklets, etc, researchers working on adult educational institutions have, since long, benefited from a range of material that give witness to the changing historical contours of educational offers and provision (Ganglbauer and Stifter 2017; Käpplinger 2008; Reichart et al. 2008). In a European context, it is to a large extent, German scholars
that have advanced our understanding of why programs from adult providers provide a particularly useful starting point for sociological, historical and educational research (Fleige et al. 2018; Gieseke 2017; Käpplinger et al. 2017; Nolda 2009). While these studies have been multifaceted and diverse both in terms of the methods used and theories developed, they have not been built on a fully digitalized repository nor made much use natural language processing and large-scale textual analysis. With this article we hope to widen the methodological repertoire of program analysis and discuss how computational text analysis can complement existing analytical strategies. We start out from the case of Swedish folk high schools (henceforth: FHS) in the post-war period and use topic models to trace the topics that has been most salient in the presentation of educational offers.

2 Aims and scope

This article deploys a mixed-method analysis on a corpus of a recently digitalized repository of catalogues from Swedish folk high schools between the years 1954–2007. By first using a text mining method called topic modelling to this rich digital archive, we trace the latent semantic structures of educational offerings over half a century. After this we analyse the three main themes derived from the data more in-depth using pertinent examples from the underlying archival material. Our research questions are twofold:

- What kind of topics and themes have dominated the educational offerings of Swedish FHS when taking into consideration the words presented in course descriptions 1954–2007?
- Why are these semantic changes taking place and how do they reflect the changing justifications of adult education throughout the post-war period?

Throughout our paper, we use course descriptions from the collection of FHS catalogues as the material research object to identify changes in the educational offerings. Based on the premises of program analysis this research object will then ground a discussion on broader educational and cultural changes taking place in Swedish society. How the FHS have addressed and presented themselves to their imaged learners and justified their existence is thereby assumed to reflect questions of wider epistemic interest, such as the expansion of post-compulsory schooling, the emergence of cultural interests or societal transformations at large in the post-war period.

The results derived from this textual approach provide a comprehensive semantic map of the most salient topics that have been used to portray the public educational offers of Swedish FHS over the long haul. Particularly pronounced themes in the collection of educational offers 1954–2007 are found to be: (i) notions related the socialisation and the institutional ethos (how); (ii) the qualification and merit of this type of education (why) and (iii) subject areas and aesthetic forms of subjectivation (what). Before presenting these findings in greater detail and specifying our study design, we will situate the context of our inquiry by providing a historical back-
ground of the emergence of Swedish FHS and the way this educational institution transformed up until the period of our study.

3 Folk high schools: a nordic institution?

A common departure for the historical accounts of FHS has been the creation of the Danish folkehøjskole and to emphasise the connections that developed between similar schools throughout Europe and beyond (Hollmann 1909; Korsgaard 2019; Simon 1960; Skovmand 1983). However, according to Zeuner (2010), the very first FHS/VHS was German-speaking and set up in Schleswig-Holstein in 1842. Regardless of its contested origin, the first few FHS seem to have been launched somewhere in the border region of Schleswig-Holstein in the 1840s. Eventually, the diffusion of the school form reached a wide range of countries well beyond contemporary Germany/Denmark and the rest of the Nordics. The multitude of different FHS traditions, their geographical diffusion, historical longevity, and largely non-state regulated curricula, have inevitably led to organisational permutations containing stark differences in terms of their institutionalization, inclusive of the overarching purposes and content of their educational offerings.

Although international and comparative FHS research is largely lacking, leading FHS researchers have indicated considerable philosophical and ideological differences among the European FHS/VHS (cf. Korsgaard 2019; Larsson 2013; Zeuner 2010). The contemporary programs of FHS seem to depart from one another in terms of thematic orientation, degree of specialisation, target groups and overarching purpose (cf. Käpplinger 2020; Manninen 2017; Pastuhov et al. 2019). For example, although there are clear historical connections between the German volkshochschule and the Nordic folkehøjskole, the Nordic branch of FHS seems more akin to the German Heimvolkshochschulen than they are to the contemporary versions of the Volkshochschule (Hinzen and Meilhammer 2022; Käpplinger 2020; Korsgaard 2019, p. 86–87). A key institutional feature of the Swedish FHS, for example, is their connection to social movements and organisations in civil society. Traditionally, this adult education provision was organised in the form of boarding schools, and still today FHS are normally conducted as a full-time activity, not in the form of evening classes or part-time upskilling and training, which seems to be the case in the German Volkshochschule (Hinzen and Meilhammer 2022; Käpplinger 2020).

3.1 The emergence of the swedish folk high schools

The emergence and diffusion of Swedish FHS are related to the broadening of popular participation in local politics from the middle of the 19th century and onwards. Similarly, to the long durée depiction of Danish FHS history provided by Korsgaard (2019), the Swedish FHS morphed in conjunction with broader societal developments such as the increased productivity in agriculture, heightened nationalism, industrialization, democratisation and the subsequent rise of various youth cultures. By the time the Swedish FHS was launched in 1868, Denmark had already harboured FHS for some 25 years. While these Danish FHS have been claimed
to differ from the Swedish counterparts in that they were generally more romantic and nationalistic in their ideological orientation (Gustavsson 2010), the Danish FHS undoubtedly set the prime example for the first few Swedish schools which were all located in the south.

Another commonality between the early wave of Danish and the Swedish FHS was that the educational content was largely defined by the needs of the uprising class of land-owning farmers. Aside from general education and elements associated with the humanistic tradition of Bildung, the early programs were oriented to agronomy, the natural sciences and the farmer’s household (Hjermitslev 2018; Lundh Nilsson 2010). In addition to developing a new rational and scientific base for farming activities and general skills, such as writing and mathematics, the early educational offerings were mainly oriented towards canonical forms of cultural knowledge like literature, songs, and national history and political education needed to take up posts in local governing assemblies and popular movements (Korsgaard 2019, Larsson 2013).

3.2 From agricultural schools to functionaries for civil society

At the turn of the 20th century, there were in total 30 Swedish FHS which had by now begun to spread out across the country from south to north. At this point, FHS were boarding school facilities located in the Swedish countryside but, similar to their contemporary German counterparts (VHS), they were mainly run by the regional governments (Hinzen and Meilhammer 2022). Around the turn of the century, the participation in FHS was also extending to include more women. However, Lundh Nilsson (2010) has shown that female participation was for a long time held separate from the regular and generic “winter courses” for men and limited to shorter and more domestically oriented “summer courses”.

The institutional metamorphoses from being agricultural schools for farmers run by various types of regional governments, to become strongly associated with organisations of Swedish civil society had to do with the modernising economy and the force of a wide array of social movements in the late 19th and early 20th centuries (Gustavsson 2010; Larsson 2013). Organisations within the civil sphere increasingly started to make use of the FHS in their ambitions to further educate “their own people” as well as to recruit people within the local communities for their social and political causes. The democratic developments created a ramped-up demand and growth for a cadre of organisational functionaries attached to these popular movements. Hence, most of the Swedish FHS that was launched in the early- to mid-20th century did not have regional governments as their institutional custodians, instead, they were backed by independent and value-oriented organisations in the civil society such as social movements of either political or religious orientation (Håkansson 2019; Larsson 2013).

Well prior to the creation of the Swedish welfare state, some FHS had already become important providers of skills and competencies in cultural and political fields of notable importance at a national level, such as the training of large segments of the members of the Swedish parliament (Hellén 1968) and numerous famous authors and journalists (Furuland 1971). Moreover, with the gradual build-up of the
welfare state, there was an expanding demand for more mass-educational initiatives in which the FHS came to offer preparatory vocational programs for applying to nursing schools or teacher education (Hjermitslev 2018; Landström 2004). As the school form expanded, the Swedish FHS gradually outnumbered their Danish counterparts, and the social recruitment structure gradually became more differentiated and socially heterogeneous.

3.3 Institutional competition and functional differentiation

By the 1950s and 1960s Sweden had created a comprehensive school system that was threatening to make the FHS redundant (Husén 1961; Larsson 2013). On top of that, universal accessibility to “second-chance education” through municipal adult education (Komvux) (1968–) and the gradual massification of higher education, further complicated the institutional niche adopted by the Swedish FHS. However, the rising interest in culture, music, and media in the youth generations of this period proved to be fertile ground for injecting new educational demands that the FHS responded too. After a long series of welfare reforms and technological advancements in media technology, new possibilities had opened up for the youth to construct their own cultural identities as separated both from childhood and the world of adults. Reformed legislation for the Swedish FHS had opened the possibilities to provide more specialised and vocationally oriented programs at the FHS than was the case in the past (A. Larsson 2007). Korsgaard (2019) describes a parallel development among the Danish FHS, where aesthetical subjects suddenly went from being subsidiary subjects to taking more of a centre stage.

Generic courses, corresponding to either elementary- and upper-secondary school level, were still part of the provision but now the Swedish FHS also held the option of providing specialised profiles, effectively corresponding to a voluntary form of tertiary education. With the emergence of these specialised profiles, the FHS began expanding and experiment in various new vocational and artistically oriented areas, offering youth and adults a way to concentrate their studies on a specific subject, political cause, or area of interest regardless of whether it was for a given vocation or more based on a deep-seated personal exploration.

It is within this period of intense educational reform that our study will begin to explore the educational offerings of the Swedish FHS. Hypothetically, we can assume that the historical transformations of the FHS offers have continued to morph and evolve during this post-war period. Yet, there is little systematic research on the developments of how the offerings and course descriptions of Swedish FHS have evolved over time. Landström (2004, p. 154), who has done the most ambitious qualitative inventory of the national catalogues of Swedish FHS to date, finds that the vocational orientations in the school form belong to four different ideal types: “the Benefactor”, “the Communicator”, “the Leader” and “the Craftsman”. According to Korsgaard (2019) the Danish FHS was thoroughly modified by the advancements of the political radicalization and youth cultures of the 1970s, which gradually brought about ‘an aesthetic turn’ for the FHS programs.

As for the similar schools in the German VHS-system, a recent overview by Reichart (2018) has found that, since 1962 and based on realised educational programs,
the VHS has primarily consisted of language courses roughly encompassing 1/3 of its total provision. Similarly, Käpplinger (2020) have studied what subjects that characterises the contemporary German VHS-system and found that it is mostly oriented to language training and vocational training. However, Käpplinger (2020) also encourages similar studies within other national contexts as “the institutions and organisations of adult education are vastly different depending on the country in question”.

Hence, the great variation of FHS/VHS provision in various national settings, the organizational flexibility and in-determination as to what levels, content, target groups, and overarching purpose they ought to address, makes them particularly interesting to study empirically. One way to provide answers to these queries is to follow the lead of program analysis. Our study design, toward which we shall turn next, therefore centres on the educational offerings through which the FHS have presented their educational content to (imagined) participants and the general public.

4 Research design: text analysis of educational offerings at the swedish folk high schools

Program analysis is now a well-established tradition and research approach of adult education research (Caffarella and Daffron 2013; Wilson and Cervero 2011) and many different kinds of analyses have already been based on mapping out educational offers and course descriptions of various forms of adult educational providers (e.g. Cervero and Wilson 1994; Gieseke 2003; Käpplinger et al. 2017; Manninen 2017). Building on the advancements made within program analysis, scholarly attention has been directed to different types of documents (brochures, homepages, annual reports, catalogues, etc.) that inform us how education is supposed to be carried out, what content it contains, who is being addressed by its promotional material and which organisations and providers that is responsible for it (Nolda 2010, p. 246).

As pointed out by Nolda (2010) the plurality and relative autonomy of adult education provision tend to be reflected in the diversity of their program descriptions: their different scopes and aims, the varied content, the different forms of presentation and the degree of speciality and accessibility. As shown within this research tradition, catalogues, programs, and courses of adult education providers are material artefacts of particular importance, as these educational actors are constantly forced to make their educational offerings ‘hang together’ with changing demands balancing supply and demand (Gieseke 2017; Gieseke et al. 2018). Compared with lower-level schools or higher education, providers within adult education tend to offer programs and courses that are more fluid, changeable and varied over time, thereby reflecting the changing Zeitgeist of society at large as well as to cater to more localised circumstances and demands.¹

¹ The German notion of Zeitgeist has, among sociologists of culture, been seen as a term to denote “period-specific cultural patterns” (for an overview of research see: Krause 2019).
Another facet highlighted in this research tradition is the central importance of the programs andcatalogues for managing and legitimising the organisations and institutions involved and for signalling what values they stand for and who might belong there (Käpplinger et al. 2017; Kuhlen and Egetenmeyer 2022). Program research can therefore both deal with the creation of programs—for example, the planning activities, the identification of target groups, and the weighing and negotiating of potentially conflicting interests—and look at the way programs are bundled together by numerous subject areas, value claims and justifications as educational offers (Gieseke et al. 2018). In the following, we will exclusively deal with the latter, and will therefore designate the material we analyse as educational offerings as it only deals with formulations and presentation of intended educational content on a word-by-word basis, rather than looking at educational planning actions or the operationalization of program content in action (Cervero and Wilson 1994).

The national catalogues of Swedish FHS which we will use as our empirical material are be understood as important material artefacts for both the institution (i.e. all Swedish FHS combined) and the diverse assembly of providers active in setting up these educational offers (i.e. specific FHS). While all programs are locally planned, the FHS is largely relying on state funding. By cataloguing national overviews of all courses each school could extend its reach and cater to a wider cohort of students. Before the universalization of internet usage, the publication and distribution of educational offers through national catalogues was thus one of the main tools for these providers to market themselves. Since adult education participation is voluntary and the Swedish FHS lacks any standardised and state-enforced curriculum these educational offerings can also be expected to have continued to morph and change over time, to follow the trends and currents of the post-war period. For these reasons the FHS catalogues and the semantic presentation of their educational offers can also be seen as a suitable heuristic object to trace the changing definition of the purpose of adult and lifelong education (cf. Biesta 2006, 2020).

5 Methodological considerations: constructing the research object

The following empirical analysis is a baseline research initiative produced upon a newly constructed digital database of national FHS catalogues in Sweden. Contrary to Austria and Germany, where public archives of programs from adult education providers have been curated and maintained for a long time (cf. Ganglbauer and Stifter 2017; Käpplinger 2008), there has not existed any specific archive for the FHS in Sweden. To construct knowledge about what topics and themes that have dominated the educational offerings of Swedish FHS in the post-war period we, therefore, had to build the infrastructure upon which this research was conducted.

This process began by creating an open repository based on printed catalogues from two major Swedish archives. Of particular importance for building a comprehensive picture of the FHS institution was the content of national catalogues

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2 The archives that provided the physical copies of catalogues were Royal library (Kungliga biblioteket) and The national archive (Riksarkivet).
The latent structure of educational offerings—tracing topics from folk high school catalogues ranging from 1952 to 2019, in which all FHS had their educational offers listed and described. These catalogues had been printed by governmental authorities in Sweden: Swedish Labour Market Board, the Board of Education, and the Information Service of FHS (see Table 1). By OCR-scanning 57 national catalogues in this period and publishing this material in the form of an open and searchable repository, we provided an open and searchable database for anyone to use (Nylander 2019, 1).

Since this digitalized material was scanned using OCR-based technology, it had the benefit of providing us with a fully digital repository with possibilities of deploying large-scale text mining methods on its content. Text mining methods such as topic modelling is particularly effective for revealing the “hidden thematic structure in large collections of documents” (DiMaggio et al. 2013, p. 577). Rather than building the analysis on single search terms, manually coding them or using pre-established categories of educational content, topic modelling allows for a more explorative and comprehensive form of text analysis where topics are formed inductively from the words used in the course descriptions. The topic model produces these sets of interpretable topics by means of machine learning algorithms, where each topic is composed of groups of words that belong together when compared to the other words in the full corpus. In other words, topics share a family resemblance based on the words they contain and based on relationality (DiMaggio et al. 2013).

Topic modelling is useful for our purpose of identifying changes to the FHS educational offers because it helps generate comprehensive image of which topics and themes that has been prevalent in the institution over the course of a long period of time. Topic modelling has some similarities to the type of qualitative methods conventionally used in adult education research; in that it is an explorative research strategy which still requires a fair deal of interpretative work (Nguyen 2017). However, contrary to most other qualitative methods, topic modelling uses statistical inferences to capture the co-occurrences of words and identify latent

### Table 1 Overview of the Dataset based on National catalogues of Swedish FHS

| Period      | Total Number Swedish FHS | Number of Catalogues in sample | Number of Pages in sample | Number of descriptions in sample | Name of Publisher                        |
|-------------|--------------------------|--------------------------------|----------------------------|----------------------------------|------------------------------------------|
| 1954–1969  | 89–105                   | 9                              | 518                        | 690                              | The Swedish Labour Market Board          |
| 1970–1979  | 105–114                  | 10                             | 988                        | 3739                             | The Swedish Labour Market Board          |
| 1980–1989  | 114–128                  | 7                              | 689                        | 2085                             | SLMB/BE/ISFH                             |
| 1990–1999  | 128–147                  | 10                             | 1100                       | 5956                             | Information Service of FHS               |
| 2000–2007  | 147–150                  | 7                              | 1000                       | 8302                             | Information Service of FHS               |

3 https://ep.liu.se/databases/fhdb/search.aspx.
semantic structures of semantic presentations, which is sometimes referred to as a “bag-of-words model” (Blei et al. 2003). Regardless of their syntax and word location, the topic model uses statistical inferences to capture these words in patterns of co-occurrences: where each topic is characterised by a distribution over all the words and each word is given a distribution of which topic it belongs to (Blei et al. 2003).

After having identified the most salient topics in the overall presentation of all the Swedish FHS course descriptions, we sought to typify them into larger themes and use concrete examples from these major themes to illustrate pertinent cases. In selecting examples for this “close” reading of the text, we took as the starting point the words that were identified by the topic model as most distinguishable for each major theme in the overarching data analysis.

5.1 The material and research procedure

Our analytical process can be described as iterative and abductive (Krippendorff 2019). The empirical starting point for this study is the descriptions of educational offers from the National Catalogues of Swedish FHS published between the years 1954–2007. In these catalogues, the various courses offered at the FHS are listed, labelled and described. The reason why we selected the period 1954–2007 is because it is large enough of a timespan to trace pertinent changes to the whole institutional system of FHS while building on a data material that is comparable in terms of quality, function, and content. From 2007 onwards the catalogues were less elaborate, as much of the marketing and recruitment of students changed to an online mode. Prior to 1954, the text quality of the OCR-treated text material was of a lower standard, so these catalogues were also excluded from the analysis.

After the national catalogues had been OCR treated and made into an open digital repository, they became searchable on a word-by-word basis and possible to export to other software. Using the API function we could filter out irrelevant descriptions of the FHS from these catalogues—such as information about each of the school’s location, application dates, etc.—and build a collection of text concentrated on descriptions of educational offers. To derive these more precise snippets of text, numerous scripts were created. Because the structure of the catalogues also varied across the different periods, several variations of these scripts were created to refine and fine-tune the analytical precision. The final number of course descriptions identified in can be found in Table 1 along with the number of Swedish FHS during each period and name of publisher.

In more procedural and technical terms, all identified course descriptions were then pre-processed using Sparv (Borin et al. 2016). Sparv is a text analysis tool consisting of various components for corpus annotation. For this study, we used

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4 In this way the material differs substantially from their German counterpart as they have been scanned using newer technology. API stands for Application Programming Interface.

5 All identified course descriptions were pre-processed using the Sparv-pipeline (Borin et al. 2016). The changes of governmental agency reflect the changing understanding of FHS in the 20th century, from being located at the Labour market board to becoming run by an agency related to liberal adult education.
three components of Sparv; the tokenizer, lemmatizer, and part-of-speech tagger. The tokenizer separates the text into word-like units (tokenized words), for example, a word with trailing punctuation is split into two separate tokens. The lemmatizer transforms all inflections of a token to its base form (lemma), while the part-of-speech tagger labels each token according to its part-of-speech. Finally, we applied a frequency filter to prune tokens that were present in more than 50% and less than 3 of the course descriptions. This was done to ensure that the generated topics would not get diluted with rare and frequent words as that would give little aid in interpreting the topics.

We generated the topic models with software written in Python⁶ and decided on the number of topics based on screening the outcome of various topic models (10–70 topics). Based on these initial tests we decided that a model of 10 topics provided sufficient detail and variation to provide room for further analysis of the topics and themes in the FHS. While the selection of fewer topics means that the inherent heterogeneity of the FHS might be underestimated, it is a methodological choice

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⁶ We used the Gensim-library (Řehůřek and Sojka 2010) with fixed β- and adaptive α-parameters for the topic model generation. The models were subsequently visualized with a Python version of LDAvis (Sievert and Shirley 2014).
that makes sense here given that we want to map out the semantic commonalities in the entire FHS system. Once this topic model was settled, we analysed the data looking for differences and commonalities in terms of themes and latent semantic structuring (see Fig. 1).

6 Results: the latent structure of folk high school offerings

The findings will be presented in two parts. Firstly, we specify the semantic structure of the FHS offerings by providing both a synchronous and diachronous analysis of the main themes spanning the period from 1954 to 2007. After these descriptive
maps of the core vocabulary in the catalogues, we interpret these major themes by using pertinent examples from specific FHS. While the first part corresponds to a distant reading of the full text corpus, the second part is built upon a closer reading of some particularly interesting course descriptions.

### 6.1 The synchronous view

One way to visualise the results is to look at the relationality structured map of the topics through a two-dimensional scale (Fig. 2). Topics that are placed close to one another in Fig. 2 share semantic semblance with one another, whereas topics that are distant from one another in the intertopic map differ from one another.

The biggest and most centrally located topic in the model is clearly number 1. This topic assembles almost ¼ of all the tokenized words in the overall marginal distribution of the map with growing prevalence over time (Fig. 2). By the size and location of Topic 1, we can conclude that it is the core theme in the self-presentation of the FHS offerings during the post-war period. It contains the following distinguishable words: *will, work, be, knowledge, have, practice, human, and study*. Given that topic 1 is the biggest theme in terms of overall salience, it is not very surprising that it is equivocal. The expression of key learning activities—“practices”, “work”, “study”—is placed alongside other open-ended verbs such as “will”, “be” or “have”, in the presentation of FHS offerings.

Even though Topic 1 is such a broad and elusive topic gathering roughly ¼ of all tokenized words over a long period of time, these words seem to distil some of the central values and justifications uniting the Swedish FHS. Regardless of the ideological orientation of the provider or specific educational offer, the FHS tend to put great emphasis on processes rather than measurable outcomes. They also convey values related to education as an open-ended socialisation process—a matter of being and doing—to a surprisingly high degree.

While topic (#1) focuses on the *modus operandi* and shared institutional ethos among a wide range of FHS providers; other topics are more informative regarding the “why-question”. For example, the topics aggregating in the south of the map—2, 3, 5, and 8 (Fig. 2)—all, in various ways, portray the preparatory, compensatory, and qualifying justification of the FHS. These topics are grouping the following words together: *eligible, to know, university studies, core subject, study, upper-secondary level, generic course* (Topic 2)—cooperation, week, university, culture, wellness, project, course (Topic 3)—elementary school, grade, specialisation, other, subject, profile, natural science, student (Topic 5)—and society, wide, complement, prepare, high, Swedish, preparation (Topic 8). These topics centre on words conveying the value of FHS programs in terms of the relations the FHS have to other institutions, their accredited worth and formal merit. Rather than emphasising collective socialisation processes or open-ended intrinsic activities of schooling, this theme is composed of topics justifying the FHS through institutional certification or “instrumental reasoning” (Wilson and Cervero 2011). The FHS is now presented as a means-to-an-end, and its place in the formalized hierarchy of education is more pronounced.
A final major theme in the topic model consists of a group of topics in the north of the map that mainly deals with the content of the Swedish FHS provision in the post-war period, i.e. the didactical “what-question”. Whereas Topic 4 specifies the most common subjects of generic courses corresponding to elementary- or upper-secondary level—Swedish, social sciences, mathematics, English, history, psychology—most of the other topics—topics 6, 7, 9, 10—are manifesting content from the specialised profiles. The increasing importance of arts education, music, craft, media and culture is clearly conveyed within this “what”-oriented theme. For example, topic 6 is built around the following words—picture, textile, drawing, ceramics, weaving, digital, form, painting, design—whereas topic 10 contains: video, dance, carry out, radio, information, production, film, and music academy. Topics 7 and 9 are more mixed topics, but also contain an aesthetic connotated vocabulary where words like “artistic”, “do”, “different”, “sculpture”, “personal” or “read” are commonplace.

6.2 The diachronous view

Looking instead at the diachronous image of how these ten dominant topics have trended over time in the presentation of the FHS educational offerings (Fig. 3), we see a stronger emphasis on justifying the FHS with words describing socialisation processes and the core institutional ethos (Topic 1). These results might seem somewhat counterintuitive, given that much of the debates about the public legitimacy of adult- and lifelong education has indicated that individualised notions of learning
Table 2  Overview of the model of 10 topics based on program descriptions from Swedish folk high schools: 1954–2007

| Topic | Distinguishable words (Relevance metric 0.6) | Freq. (in %) | Trend | Main Question | Main Theme |
|-------|-----------------------------------------------|-------------|-------|---------------|------------|
| 1     | Will, work, be, knowledge, have, practice, human, study | 23.7        | ↑     | How?          | Socialisation & FHS Ethos |
| 2     | Qualified, to know, geography, university studies, core subject, study, upper-secondary level | 13.3        | ↘     | Why?          | Qualification & Merit_generic |
| 3     | Cooperation, week, university, culture, wellness, project, course, day | 10.4        | ↘     | How?          | Qualification & Form_generic |
| 4     | Swedish, social sciences, mathematics, English, history, photo, psychology | 9.7         | ↓     | What?         | Subject-areas_generic |
| 5     | Elementary school, grade, specialisation, other, subject, profile, natural science, student | 9.1         | ↓     | Why?          | Qualification & Form_generic |
| 6     | Picture, textile, drawing, ceramics, weaving, digital, form, painting | 8.7         | →     | What?         | Subject-areas_Plastic Arts |
| 7     | Artistic, do, goal, mix, basic education, own, disability, be | 8.5         | ↘     | What?         | Subject-areas_inclusive education & art |
| 8     | Society, wide, complement, prepare, high, Church, Swedish, preparation | 7.5         | →     | Why?          | Qualification_generic |
| 9     | Go, sculpture, personal, read, group, writing difficulty, adult, small | 5.8         | →     | How?          | Subject-areas & Subjectification |
| 10    | Video, dance, carry out, radio, information, production, Film, music academy | 3.2         | →     | What?         | Subject-area_Performing arts |

as a means for qualification have gradually replaced the conceptualisation of adult education as a socialisation process of particular groups or imagined communities (cf. Biesta 2006, 2020, 2021).

Another visible trend in the heatmap (Fig. 3), is that aesthetic specialisations have made clear inroads in the full corpora of course descriptions, while the frequency of ‘all-round subjects’ from generic courses (Maths, Swedish, English, History, etc) has faded out of popularity and frequency. These results are perhaps less surprising given the overarching trends towards a functional differentiation of the FHS offerings and the increased importance of aesthetic forms of subjectification in the post-war developments of the institution (cf. Hartman 1993; Korsgaard 2019; Fürst and Nylander 2022). However, the trend towards an increased functional differentiation within the FHS and the tensions arising from rivaling conceptualisation of “what the FHS is good for”, warrants some further investigations.

As we can see from the overview of the results from the topic model (Table 2) there are thematic differences in the topics formed by the model. Much of the semantic content derived from the course descriptions relates to ‘the eternal questions’ of didactics such as why potential learners should attend school, what they can expect to learn, or how this learning is organised and operationalized (Jank and Meyer...
The latent semantic structures of the FHS offerings also speak for the values and ideals expressed regarding the overarching purpose of learning (cf. Rose and Fleige 2017; Biesta 2020). Hence, the FHS educational offerings simultaneously convey answers to fundamental questions on the legitimacy of adult education: how these programs are supposed to be carried out, what societal function they serve, their claimed need or utility within the educational system, and details some of the most common subject areas.

To understand more about the semantic composition of these topics we are now going to discuss them in greater detail using pertinent examples from the digitalized program repository. The discussion will cover the three broader themes that were identified through the topic modelling exercise: socialisation and the institutional ethos (how); the qualification and the merit (why) and subject areas and aesthetic forms of subjectivation (what).

### 6.3 Socialisation and institutional ethos

As evidenced by the heatmap (Fig. 3), Topic 1 has gained considerable momentum in the educational offerings from the late 1970s and onwards. Generally speaking, the way the educational offers and content are presented to the imagined participants of FHS is much more elaborated and decorated with lengthy descriptions toward the end of the period. The most important reason for this is probably the increased institutional competition the FHS faced in the wake of an ever-expanding educational system. The multitude of providers gradually entering and expanding mandatory, secondary and post-secondary education increased the importance of all FHS to market and justify their programs and educational offerings as distinguishable from the rest of the choices youth and adults can make at roughly the same educational level.

Historically, the FHS has been seen as a forerunner in providing educational options for social groups otherwise excluded from further education and has been described as particularly innovative in providing new curricula for the system of formal schooling (Larsson 2013). A necessary requirement for this has been the relative autonomy for planning and enacting a changing curriculum, which from the time the public educational system expanded, became a matter of sheer organisational survival.

In 1977 the Swedish public policy stated that the FHS were meant to “promote general civic education” (Folkhögskoleförordningen 1977, p. 551). So once the state had rolled out comprehensive schooling and expanded higher education and “second-chance education” on a mass scale through Komvux, the FHS was meant to conserve some of the distinguishing institutional features while, at the same time, being forced to find new organisational niches.

One concrete example of a communitarian form of civic justification for the FHS comes from Viskadalens vocational programs for ‘leisure leaders’ from the catalogue 1985/1987. This program is by 1985 claimed to be:
... based on the values of the labour movement and wants to give the students knowledge, attitudes and skills to \textit{work} for increased awareness and a \textit{will} to create an active life in communion with other people.

Just as a majority of the contemporary FHS, this provider is attached to organisations in civil society. \textit{Viskadalen} course description emphasises the collective group interests of the labour movement as foundational for the cultivation of leisure leaders: the students should learn to empower others and increase the awareness. However, such a communitarian ethos of defining collective “the wills” as the cornerstone for the FHS gradually gave away to a more individualised orientation of “the will” focusing on triggering individual inspiration or adjusting to personal learning needs.

Looking closer at the way these core value propositions were verbalised in the FHS own educational offers—words such as “will”, “human”, “work”, “be”—expose some changes in the meaning of this core vocabulary over time. One archetypical example of a more individualised take of the core vocabulary comes from \textit{Katrinebergs FHS}, which presents its course in handicraft (2003/04) as a:

basic course for you who like to create with your hands. We alternate practical and theoretical studies. The main subjects are visual arts, ceramics, and textiles (...). No previous knowledge is required, but curiosity and \textit{willingness} to try on different materials and modes of expression.

\textit{Katrinebergs} course description is again advocated by some of the core vocabularies from Topic 1 but this time starting from the \textit{willingness} to create “with your hands”. Hence, the starting point for the self-presentation of the FHS is no longer a communitarian “will” to transform society based on any given civically rooted ideology, but rather a “willingness” of the participants to engage in an open-ended aesthetic learning process. So, while the core theme of the Swedish FHS offerings gradually come to centre on socialisation and the institutional ethos, the “how” as opposed to the “why-questions”, these descriptions still convey clear tensions between collective and individualised learning aims, political and aesthetical worth as well as the holistic and specialized educational offerings (Cervero and Wilson 1994; Gustavsson 2010).

6.4 Preparatory qualification

Another important reason why the elaborated statements on the social aspects of FHS studies have gained prominence over time might be the influence of dialogue-based thematic studies and problem-based learning (PBL) in the program planning of the Swedish FHS during the post-war period. What is clear from our findings is that the strong subject-specificity of standardised educational offerings of the 60s and 70s gradually made way for educational offers with much weaker boundaries between knowledge areas or subjects.

In particular, the generic courses of the FHS seem to have followed the path of the overarching process where strong classifications of subject-area expertise have given way to weaker classifications and the subject-based teaching has given way to more
thematic and dialogue-based learning practices (Biesta 2020). This development, which become gradually become more pronounced from the 1980s and onwards, might be linked to thematically oriented studies and problem-based learning being seen as more egalitarian and attuned to the personal inclinations and interests of the learner involved.

However, regardless of what triumph of ‘flat’ problem-based and thematic studies might have had in the realisation of these programs, the qualifying and preparatory dimension of FHS offers is still clearly visible in these findings. Even if topics 2, 3, 5, and 8 in the south of the map (Fig. 3) differ slightly from one another in terms of their distinguishing discourses, they share an orientation toward presenting the FHS as a preparatory form of qualification. Importantly, the value of the FHS is warranted in relation to an outcome or other type of qualifications the participant might strive for and be attached to. For the potential learners to recognize the utility and level of the educational provision offered, formal requirements for the courses and potential career paths for further studies are highlighted. These markers of qualification tend to relate to the form (size, length), the content (‘core subjects’), and the utility of the FHS training.

Typically, these qualifying functions are more highlighted in the generic course offerings that correspond to the elementary- or upper-secondary school levels:

The generic course, which does not address any specific target group, intends to provide the student with orientation in general subjects and stimulate personal development. It also aims for the student to apply for University after two- or three-year studies, depending on previous school background. To be able to achieve general eligibility for university studies great emphasis is placed on Swedish, literature, and English. (Edelviks FHS 1981/83)

To build legitimization for their educational pathways, the FHS providers position these educational offerings in relation to the larger educational possibilities that opens up by becoming “eligible” for higher education. In the case of Edelviks FHS description from the early 1980s, there is an ambiguity between stressing personal development and the accreditation and accessibility for university access. Hence, rather than being fully subsumed under the logic of ‘instrumental reasoning’ (Wilson and Cervero 2010), these descriptions contain institutional tensions and negotiations in which open-ended value statements related to personal development, social inclusivity, recuperation, inspiration or growth, are presented in conjunction with the acclaimed merits of the FHS. As a compensatory option and second-chance education, the generic courses of the FHS are obviously more dependent on being verified through its relationship to other formal institutions, whereas the qualification of specialized courses is possible to conceive as valuable ‘in their own right’.

6.5 Functional differentiation and aesthetic subjectification

A final theme that stood out from the overarching topic model had to do with these different subject areas offered in the FHS and the emergence of aesthetic specialisations. The national catalogues convey a picture of functional differentiation,
which is most clearly illustrated by looking at the cultural and artistic content over time.

For example, back in 1965/66 Stensunds FHS offered their potential participants a 3 year study scheme containing the following group of subjects:

Swedish, literature, book- and library knowledge, history, social studies, psychology, geography, English, German, mathematics, biology, physics, chemistry, art orientation, music orientation, philosophy of life, theatre, unison song, choir song, handicraft of textile and metals, accounting, machine typing, gymnastics, folk dances, cultural dances and practical work.

This long assembly of subjects—ranging from language training, natural sciences, economy to culture and craft—might strike the contemporary reader as rather odd. Stensunds program of 1965/66 is presented through a list of subjects covering a heterodox array of knowledge domains. Importantly, the plethora of aesthetic subjects were offered within a standardised program and alongside the subjects found in the general curriculum (Swedish, maths, history, etc). Furthermore, practical and theoretical knowledge were presented as combined with one another in an comprehensive, holistic but compartmentalized structure.

Toward the last two decades of the 20th and early 21st century, the aesthetic subject areas are, on the one hand, more visible in the course descriptions of the national catalogues but also, on the other hand, given a more distinct role as profiles of specialisation. For example, in the catalogue of 2004/05, Sommenbygden FHS offers a profile in African-American music where the potential learners are selected through auditions and interviews after which they are offered a course that:

give interested musicians and singers the opportunity to develop in pop, soul, jazz and gospel, i.e. “afro music” (sic). The core of the course is the backing group and the choir. Based on these components, studies include singing and specialisation on the main instruments, music theory, and arrangements, management and leadership as well as ethical issues and the bible.

In the case of Sommenbygden, like many other FHS providers, the profile offerings are devoted to an aesthetical niche in which instrument skills shall be exhibited upon application and more refined preferences within the rich African-American music tradition are cultivated at the site. While the students attracted to “Afro music” learn other subjects when specialising in jazz and soul, the description communicates a narrower aesthetic area of cultural preference. In the case of Sommenbygden, this musical niche have evolved from the emphases that live music performances have had within the religious rites and ceremonies among free-religious Christian denominations.

The connection between the contemporary cultivation of music skills and its roots in the free-religious movements might be conceived of as an example of how programs and educational offers gradually evolve and mutate to reflect the changing cultural zeitgeist while also baring some connections to the local organisers (Gieseke 2017; Nolda 2009; Krause 2019). In this case, the sacred pretensions that art and music uphold within a largely secular society, remain curiously linked to its “spiritual ancestor” in the form of a free-religious denomination.
However, as compared with the broad-based array of subjects offered in Stensund of the 1960s, this is an example of a more specialised course offering enabled by the extended mandate the FHS got to provide specialized training toward the second half of the 20th century. Due to the specialised area of cultural interest the provider seeks to attract students with a field-specific area of expertise, something that is also tested through a performance-based audience prior to admission. Similarly, to the FHS in Denmark, the aesthetic subjects have gradually gone from being subsidiary subjects in the Swedish FHS to becoming areas of specialisation (Korsgaard 2019).

7 Concluding remarks: lessons learned

This article set out to explore a newly digitalized repository of catalogues containing descriptions of educational offerings from Swedish FHS. Based on approaches emerging at the crossroads of computational linguistics and social science during the last few decades, we suggested that digitalized text material is crucial for widening and deepening the methods deployed within ‘program analyses’ (cf. Caffarella and Daffron 2013; Käpplinger et al. 2017; Wilson and Cervero 2010). Especially the creation of large-scale archives and digital repositories, whose intimate relation to the advancement of knowledge in the field has already been proven in numerous contributions among German colleagues (cf. Fleige et al. 2018; Nolda 2010; Reichart et al. 2008), provides exciting infrastructures for powerful forms of large-scale content analysis.

Once these knowledge infrastructures are created using OCR-based technologies, they will likely lie the good foundation for a range of text mining methods such as topic modelling, with a proven track-record in dealing with heterogeneous collections of textual data (cf. Crossley and Kyle 2018; DiMaggio et al. 2013; Nguyen 2017). Compared with program analysis based on single search terms, predefined subject categories, or the fabrication of survey-based questionnaires (cf. Manninen 2017; Käpplinger 2020), a fully digitalized repository can generate a more fine-tuned form of analysis of the thematic structures of educational offerings, while still being able to provide comprehensive “maps” of semantic changes in the full institutional landscape. Taking into consideration the course descriptions in their entirety, rather than starting out from administrative classifications or pre-defined questioners, could be one way for program researchers to reach the deeper layers of educational offerings while bracketing out our own preconceived ideas.

Another advantage of these text mining tools, appear in relation to the tedious and difficult work of manually coding and classifying a large corpus of programs (cf. Iffert et al. 2021). Here topic modelling can provide a methodological procedure that is more time-efficient, scalable, and reliable as it builds on a data-driven coding and classification of programs and educational content, in accordance with a given set of principles. It is also easy, even with rather basic programming skills, to build upon the analytical protocols, software’s and codes developed among data scientists and deploy them on related material, which opens up for comparability. To explore pertinent differences between different organisational providers or across
geographies (Gieseke 2017), one could use *structural topic models* rather than the unsupervised and explorative approach we have tried to exemplify here.

Our main intention with this paper was to point to the potential of using topic modelling for widening the methods used in program analysis. At the same time, there are clear limitations of what these novel forms of computational text mining methods can do. To fruitfully interpret the results emerging from the data-driven and algorithmic analysis of large collections of text, we still need both a deep contextual understanding of local circumstances and useful theories to guide us. For example, Krippendorff (2019) stresses that computers are bound to the scripts, algorithms and protocols created by programmers, and while these analytical procedures can entail manipulations of data that are far more complex than our human mind can cope with, these machine-based tools still cannot analyse anything beyond what it is meant to process. Furthermore, since reading and interpreting processed data is still an indispensable part of the analytical process, even in the cases when it is aided by the advantages from machine-based algorithms or probabilistic mathematics, content analysis can still be regarded as a qualitatively oriented research method in that it is very reliant human judgements for interpreting and understanding these results.

Computational textual analysis should therefore be seen as complementary to holistic and interpretative judgements that builds on substantial knowledge of the objects under scrutiny and the material used. In this work, for example, the creation of topic models allowed us to trace the underlying semantic structure of the rather heterogeneous collection of textual data. Nevertheless, for this analysis to make sense, and to answer questions regarding the changing justifications of adult education over time, we needed both extensive knowledge about the FHS and local circumstances relating to the transformations of Swedish school system. So, while we contend that the structuring of the large database would be extremely difficult to perform in a systematic way without the aid of the ‘unsupervised’ machine–learning algorithms, the machine-based coding procedures and automatic identification of topics still does not generate any conclusions beyond the text it has been trained on.

Once more archival material is fully digitalized using new forms of OCR treatment, we imagine that large-scale text mining methods can be mobilized for international comparative program research specifying, for example, the variation between adult educational offers such as FHS/VHS in various countries (Käpplinger 2020). Yet, this comprehensive analysis of the Swedish FHS offerings has indicated that the structural transformations of educational content are probably as much the product of the external institutional competition these adult educational providers face, as they are manifestations of their ‘inner’ ideologies, the values they embrace, or ideals professed. For international comparative program research on adult institutions to be fruitfully operationalized using text mining techniques, it has to be launched by an international team of researchers with expert knowledge of both the data becoming processed and the context in which the semantic content occurs meaningful.

### 7.1 The case of Swedish FHS

From the perspective of the Swedish FHS offerings reflecting the structural transformations that permeated the culture at large, one might see the functional differen-
tiation of the provision as indicative of wider currents permeating Swedish society. After the second world war and during the ‘golden age of welfare capitalism’ the FHS was still clearly marked by a centralised Welfare-state while the communitarian values with roots in social movements and civil society (1950–1975) gradually made its mark on what the FHS was doing and how it was presented to the general public. However, as we progress toward the last decades of the 20th-century Swedish society is marked by increasing levels of inequality, as the educational offerings of the FHS start to cater their educational offers to meet these widening social disparities.

In a comparative study of lifelong learning systems, Verdier (2018) has characterised the Sweden as undergoing a process of hybridization, gradually departing from what he calls a “universal regime” to be more akin to the “organised market regimes” in Anglo-Saxon countries. Even if the FHS still emphasises socialisation and community-building processes more than many other comparable adult education institutions, it does not seem to be an institution vaccinated from this drift from universalist to market-oriented values. Rather, in the wake of increased institutional competition and widening social heterogeneity among its participants, the Swedish FHS has differentiated its educational offerings which are now, on the one hand, meant to cater to the demands of aesthetic subjectivation and, on the other hand, directed to groups excluded from the educational system as a whole.

Due to the institutional flexibility of the educational offerings embraced by the FHS, these providers developed a range of new offers to meet the growing interest to engage in cultural training like music, craft and the plastic arts. Somewhat paradoxically, meanwhile the state adopted a policy in the 1970s portraying the overarching aim of the FHS in line with what they had been doing in the past (“promoting general civic education”), these offerings seem gradually to advance purposes with a stronger emphasis on problem-based learning, personal development, artistic inspiration and aesthetic forms of subjectification (Biesta 2020, 2021). Although this has made the FHS educational offerings more attuned to the non-standardized and heterogeneous demands of contemporary lifelong learners, with a very loose relationship to the communitarian worth once championed among its institutional custodians, they undoubtedly remain relevant as heuristic objects to understand the time we live in.

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