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How school leaders justify digitalization in vocationally oriented Swiss upper-secondary schools: a qualitative content analysis through the lens of convention theory in education

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ABSTRACT

School leaders play an important role, when it comes to digitalisation of teaching and learning. In this study, different arguments for school-specific digital strategies by school leaders were analysed from a convention theory perspective. Semi-structured interviews were conducted with 9 Swiss school-leaders of 2 secondary school types (7 vocational schools and 2 upper secondary specialised schools), regarded as digitally advanced schools. Content analysis revealed legitimation patterns including enhanced pedagogical added value, but also efficiency and networking. Moreover, most school leaders described the COVID-19 pandemic as a strong booster for digitalisation efforts at their schools. Schools with a bolder digital integration policy tend to adhere to a project-oriented legitimation. In this study we highlight the strong pedagogical focus for digital integration uttered by school leaders, which is – as our typology reveals – combined with industrial, market and project justifications.

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Digitalisation; digital integration; convention theory; school leadership; vocationally-oriented upper-secondary schools

Introduction

Digitalisation is used in this article as a term to describe 'a socio-technical phenomenon' that influences 'societies, businesses, and personal lives' (Frenzel et al. 2021). Whereas digitisation refers to turning analogue tools into digital ones, digitalisation is related to the integration of digital tools into practices – and, in our case, one that specifically changes the environment of teaching and learning in schools but also administrative processes and interaction between the different actors. Many domains are restructured around digital communication and media infrastructures (Brennen and Kreiss 2014), which end iteratively in a digital integration of daily life and work and sometimes in a digital transformation of organisations. This is especially true for education and schools.

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With this study, we aimed to explore the role of the school leaders in implementing digitalisation in schools and modifying teaching and learning in upper secondary specialised schools and vocational schools, rooted in the dual Vocational Education and Training (VET) system in Switzerland.[1] In order to highlight their beliefs and conventions they are referring to conflicting values we analysed in line with the French neo-pragmatist convention theory the importance of justifications, such as project, market, industry and other claims, when it comes to digital integration in vocational schools (see also Imdorf and Leemann 2023). The present research is however not following the approach proposed by Bourdieu, which highlights social positions in a field. Rather, we follow the tradition of Boltanski and Thévenot, who analysed actors and conflicting norms through the lens of situational negotiations.

School leaders play an important role when it comes to digitalisation. In legitimising digital integration in everyday school-life and teaching and learning in classes they refer, furthermore, to international, national and local strategies developed outside schools. Digitalisation in our study is focusing on schools, who rely on digital platforms as well as on a school policy, which is based on Bring-Your-Own-Device (BYOD). Furthermore, besides a top-down-strategy, imposed by school leaders, school-based digitalisation in Swiss schools includes a bottom-up approach insofar, as individuals or group of teachers explore and practice new activities and programs (Ruloff and Petko 2021). In the context of schools, digitalisation also partly overlaps with the concept of technology integration. Backfisch et al. (2021) distinguish between two forms of technology integration: quantity and quality of technology integration. Whereas the quantity of technology integration mirrors the frequency of technology use by teachers and students in class, the quality of technology integration is relating teaching quality and the pedagogical meaningful use of digital technologies. According to the systematic review by Consoli et al. (2023) technology integration can be defined as technology use in schools supporting pedagogical aims, or as the process leading to the fulfilment of these goals. Fittingly, various studies have shown that schools with a pedagogical focus show a higher degree of technology integration and insofar deeper digitalisation than schools with a technocentric focus (Kozma 2011). Regarding technology integration, several studies indicate that teaching quality, especially cognitive activation – that is, instructional strategies concerning a specific task that fosters students' cognitive engagement in class – is an important aspect of integrating technology into teaching and learning and is crucial for improved student achievement (Fütterer et al. 2022). Thus, in the present study, the schools were selected based on a quantitative survey indicating that they had a strong pedagogical focus in their digitalisation process and where teachers used digital technologies very frequently to foster cognitively demanding learning activities. However, we chose a qualitative approach that allowed us not only interpret digitalisation as technology integration but also focus on digitalisation as a socio-technical phenomenon mirroring the integration of digital tools in different processes encompassing teaching, learning, administrative tasks, interactions between different actors and school culture.

The role of school leaders in digitalisation at schools

Since 2010, digitalisation has been stressed as an important topic in European educational reform. In the translation process of global and national policies into local schools, school

leaders are key players. Numerous studies have shown that school leaders foster the provision of digital infrastructure at a school and support teachers in developing skills and beliefs required to integrate digital technologies (e.g. Schmitz et al. 2023, 2025; Divaharan and Ping 2010; Vermeulen et al. 2017). School leaders' support of digitalisation initiatives at a school is crucial for including digital technology in teaching and learning and is one of the key components facilitating teachers in using digital technologies in class (Petko, Prasse, and Cantieni 2018; Prasse 2012, 180–190). Many literature reviews have identified the important role of school leaders in developing a shared vision of digitalisation for their schools (Dexter and Richardson 2020). Vanderlinde, Van Braak, and Tondeur (2010, 444) concluded that vision development of the school leaders is the first important step in adapting to a national reform. In sum, support for digitalisation initiatives by school leaders and vision for digitalisation is crucial for the local adoption of digitalisation policies and the development of local school policies.

However, school leadership especially in the German-speaking countries is an under-researched and young field (Tulowitzki and Grigoleit 2023) and therefore it is unclear how school leaders handle and justify digitalisation at their schools especially in countries such as Switzerland. The systematic literature review by Krein (2023) concerning publications about school leadership and digitalisation from the last 20 years reveals that studies in this field adopt narrow and techno-deterministic perspectives of digitalisation. According to Krein (2023) it is crucial for future research to move beyond technological determinism and develop a cultural understanding of digitalisation. In order to do justice to these suggestions for future research, it would be an important step regarding the implementation of digitalisation in schools, to uncover the underlying justifications. Examining justifications by school leaders in the context of digitalisation would allow to develop an understanding of views and persistent patterns of digital education. The core role of justifications in translating global, national and local digitalisation strategies into school practice leads us to a neo-pragmatic approach. Similar like Horvath, Steinberg, and Frei (2023), we refer to a convention theory approach in digital integration in schools and explore how situated practice changes the schools.

Digital integration in schools in the light of convention theory

In what follows, we refer to the so-called 'économie des conventions' (EC) or sociology of conventions and specifically to a framework that was developed in the 1990s by Boltanski and Thévenot (2006). They originally distinguished for society and economy different orders of worth, which can co-exist at the same time and are promoted by a plurality of actors. Actors refer to one or the other order of worth and seek to justify their actions and statements by referring to one of these. These originally six worlds, each with a normative focus on conventions for the market and industry, the state and public opinion, the domestic world, and inspiration compete and are often the basis for a compromise. To these worlds was added in the light of a rapidly changing economy and society in a later publication, 'The New Spirit of Capitalism' (Boltanski and Chiapello 2005), a seventh, a project-based order of worth. Other authors adhering to this neo-pragmatist approach added even another green order of worth (see e.g. Thévenot, Moody, and Lafaye 2000).

This approach is also suitable for analysing educational phenomena and education policy, since different claims of different actors need to be negotiated and compromises

have to be fixed to make the educational system work (see Imdorf, Leemann, and Gonon 2019). Already in the 1990s Derouet (1992) adapted these convention categories as orders of worth for schools. Further studies show that the focus of research in this area is on post-compulsory education and vocational education in particular (see e.g. Verdier and Janmaat 2013). As the situatedness of vocational schools between state and labour ground bears potential conflicts between different orders of worth, education policy and schools emerge as an interesting subject for research on convention theories.

In what follows, we highlight a shortened version of the convention-based framework, which represents several orders of worth, as unfolded for the educational field by Imdorf and Leemann (2023). The authors distinguished between seven legitimations: civic, industry, market, domestic, project, creativity, and fame. According to our findings, we extend this model with an eighth category, the green order.

This list of conventions, in line with many other lists encompassing legitimations (see, e.g. Diaz-Bone 2018, 162–163) allow an analysis of tracking processes, which is characterised as 'heuristics of the worlds of schooling' (Imdorf and Leemann 2023, 13). These orders of worth belong to a historically developed dispositive in a school setting. Such a dispositive is the basis for long-term and often informally regulated coordination (Bessy 2017). In moments and situations of change or conflict, worth-based claims, that is, conventions, can be mobilised to legitimise an action on a policy level as well as to organise learning processes.

Until now only a few studies in the field of convention theory have been conducted with a focus on digitalisation in education. Horvath and Steinberg (2023) identified a conflict between the industrial and creativity convention, which also play a role concerning the topic of social inequality. The main concern in empirical studies was to identify the dominant conventions and the compromises that were found to gain a common ground in implementing new strategies upon digital integration in teaching and learning. In their study on Chat GPT, Frei, Steinberg, and Horvath (2023) focused on the role of conventions related to a plurality of school worlds and divergent logics of action. The aim of personalised learning follows the idea of optimisation and rationalisation, and thus, the plurality of justifications relates to efficiency (as a central feature of the industrial world), inspiration (creativity), and marketability (market) (Frei et al. 2023, p. 147). Steinberg and Schmid directly addressed in their qualitative study in primary and lower secondary schools in Switzerland, based on convention theory, the expected 'autonomous learner'. According to the authors, the interviewed 'innovative' teachers referred to the inspirational world – that is, to the worth of creativity – in their attempts to individualise and personalise learning (Steinberg and Schmid 2023, 211). Furthermore, the school leaders' focus underscored a domestic convention that was implicitly intertwined with a project-based order of worth (208–214). Finally, Smeplass and Haugseth (2025) identified different tensions in upper-secondary students and adult vocational teacher students participating in online lessons during the pandemic. They had to balance personal learning preferences with institutional expectations and needed to adapt to digital tools (Smeplass and Haugseth 2025).

Materials and methods

As a first step, all Swiss upper-secondary schools were contacted and invited to participate in a short online survey asking the school leaders to nominate schools that are inspiring

role models in terms of digitalisation. In total, 291 schools participated in this survey (response rate of around 60%). In these schools, 117 school leaders nominated schools they viewed as role models regarding digitalisation. Three schools were identified for qualitative analysis: two vocational schools from the German-speaking part and one school offering a general and vocational education track in the francophone part of Switzerland.

In the second step, all Swiss upper-secondary schools were contacted again to invite all school leaders, teachers, and second- and third-year students to complete an online questionnaire. This resulted in a final sample of 225 school leaders, 2248 teachers, and 8915 students. To identify more cases for qualitative analysis, quantitative questionnaire data were used, in which the three recommended schools from the previous survey again emerged as top performers, and the data were based on theoretical constructs that were considered significant for meaningful digital integration. One scale that was used to further identify case study schools was the ICAP-TS, which covers the frequency of technology use to foster cognitively demanding learning activities for students, rated by the teachers (Antonietti et al. 2023). The other scale used to identify interesting case-study schools dealt with the degree of instructional innovation at the school, following Johnson, Stevens, and Zvoch (2007, 837–838), which was rated by school leaders. In addition, one case study school was identified through the submission of many projects to the Zurich Innovation Fund.

This selection resulted in 9 schools, among them seven vocational schools and two upper secondary specialised schools, which offer preparation for tertiary level professional education in specific occupational fields. These two school types differ concerning the curriculum and organisation of the educational institutions: Upper secondary specialised education is based more on general education and theory-orientation, in order to prepare for universities of applied sciences and/or for colleges of higher education (upper secondary specialised school program mainly in health care, education and social work). All is organised around school subjects and should be attended fulltime. By contrast, vocational schools are more practice oriented. School attendance is part-time and usually combines specific vocationally oriented subjects, but also a small part of general education tracks (Wettstein, Schmid, and Gonon 2017). The fields covered by the vocational schools included in this study technical and skilled trades, IT, logistics, gastronomy, body care, healthcare, and business. Overall, seven schools were retained for qualitative interviews in the German-speaking part of Switzerland, one school was based in the francophone, and another one in the Italian-speaking part of Switzerland. Regarding the cantons, four schools were located in the canton of Zurich and one school each was based in the cantons of Argovia, Basel, Fribourg, Lucerne, and Ticino. The interviews were mostly conducted with school principals. In vocational education school D the school principal and a teacher who also had responsibilities in terms of IT support were present. Another exception was vocational education school B where the vice-principal was interviewed. At vocational school G, the school leader who was responsible for one of the school's locations was interviewed. In the following sections we will refer to the interviewees as school leaders since they are not all principals but have leading role in their school.

Vocational school leader interviews and data analysis

All school leaders of the 9 schools were interviewed individually in their offices at their schools, except for one school leader who was interviewed online via video call. The interviews were conducted with one to three interviewers and one to two school leaders and took place between April and December 2023. Each interview took between 38 and 67 minutes. These interviews were recorded and transcribed using a large language model-based translation software. The transcribed interviews were checked by the authors of the study, and some passages were reformulated if necessary. Before the interview, all school leaders were informed and agreed to take part in a recorded interview, excerpts from which could be used for scientific publications and presentations. The interview was semi-structured. The school leaders were always asked the following questions: 'How important do you think digitalization is at your school? How do you justify your engagement in digitalization? What are the reasons for a digital transformation, and what does this mean for your school?'

Each interview transcribed was imported into MAXQDA. Only deductive categories derived from convention theory were used in qualitative content analysis (see Imdorf and Leemann 2023, 5–8). The civic convention was coded when school leaders justified their digitalisation strategies with arguments concerning equal opportunities, social integration, and societal participation. Legitimations of school leaders stressing the responsibility of their school towards the state or canton were coded civic as well since this refers to obligations to the state or canton that must be fulfilled as a school leader and citizen. On the one hand, justifications covering aspects of standardisation, plannability, efficiency, and facilitation of school-related processes, be it on an organisational or on a pedagogical level, were categorised as industrial conventions. On the other hand, arguments of school leaders emphasising the importance of teaching students (digital) competencies and preparing them for a digital world were categorised as an industrial justification as well. Legitimations encompassing aspects of competition between schools, preparation of students to be competitive, costs, and price were coded as market conventions. Arguments for the digitalisation strategies covering aspects such as living in a community, tradition, educational values and pedagogy in a familiar surrounding were coded as domestic conventions. In terms of pedagogy in the context of the domestic convention we focused in our analysis on individualised learning as a student-centred approach aiming to improve the alignment between the instruction and students' individual needs and prior experiences and to cope better with the heterogeneity in class (see Steinberg and Schmid 2023). This is in line, with the statement by Imdorf, Leemann, and Gonon (2019, 6) that in the domestic convention the understanding of education is closely related to positioning the individual at the centre and promoting individualised didactics education and development. The project convention was coded when school leaders stressed the importance of a network and a reaction to change such as pandemic-related challenges and changes. By contrast, justifications were categorised as creative conventions when school leaders focused on aspects such as inspiration, motivation, passion, calling, and innovation. The fame-based convention was coded when school leaders argued based on image, prestige, public recognition, visibility, and prominence. Finally, we introduce an ecological legitimation as an extension (see Thévenot, Moody, and Lafaye 2000) to the above-mentioned categories by Imdorf, Leemann, and Gonon (2019, 6). This justification was coded when school leaders mentioned resource efficiency caused by

Table 1. Deductive categories for the qualitative coding derived from Imdorf and Leemann (2023, 5–8).

Civic	Industry	Market	Domestic	Project	Creativity	Fame
Equal opportunities, social integration, solidarity and responsibility of the school towards the state or canton	Standardisation, plannability, efficiency, facilitating school-related processes (e.g. correcting exams, administration), teaching students' competencies, and preparing them for the digital world	Competition between schools, preparation of students to be competitive, costs, and price	Living together in a community, tradition, educational values, pedagogical aspects, and the individual personality development of students	Importance of network Need to be ready for the future/ Reaction to change (e.g. COVID-19)	Inspiration motivation, passion, calling innovation	Image, prestige, public recognition visibility, prominence

digital technologies, for example less paper use or a twin transition, where digitalisation fuels innovations in sustainability (see Table 1). Since the categories of convention theory overlap in some cases, text excerpts could also be coded with more than one category.

The interviews in the 9 schools were coded by two coders and interrater agreement was calculated using Cohen's kappa. Since no interrater agreement was lower than 62.5% and all agreements could be considered as substantial (Kuckartz and Rädiker 2019, 299–303) all coders moved forward to discuss and agree on a final version of the coded interviews without recoding individually.

Codes in interviews are presented as the ratio of the frequency a code was used relative to the overall use of codes. Furthermore, the distribution of the different conventions and their share in percentages are visualised per school. To be able to analyse the eight different conventions in the interviews in more detail, an inventory of terms and neighbouring words with matching content was developed (see Schneijderberg, Wieczorek, and Steinhardt 2022) based on the tabular representation of the conventions by Imdorf and Leemann (2023, 5–8). Most terms were derived from the description of common good and educational objectives, forms, and orders of knowledge by Imdorf and Leemann (2023, 5 - 8).

Regarding the inventory of terms, terms for the coded text were counted using the MAXQDA search function considering lemmatisation (Schneijderberg, Wieczorek, and Steinhardt 2022, 147). Only those terms were counted that also appeared in a coded text with the appropriate convention (170 – 176).

Results: a variety of conventions

In all vocational schools and upper secondary specialised schools, at least five conventions played a role in justifying digitalisation strategies. All school leaders referred to the overall most present domestic, industry, and project-related conventions. Vocational schools as well as upper secondary specialised schools, which are related to legitimation patterns not very different, also mentioned civic and market conventions. Not surprisingly, the conventions were not equally distributed within the schools, and some school leaders did not refer to all norms (see Figure 1).

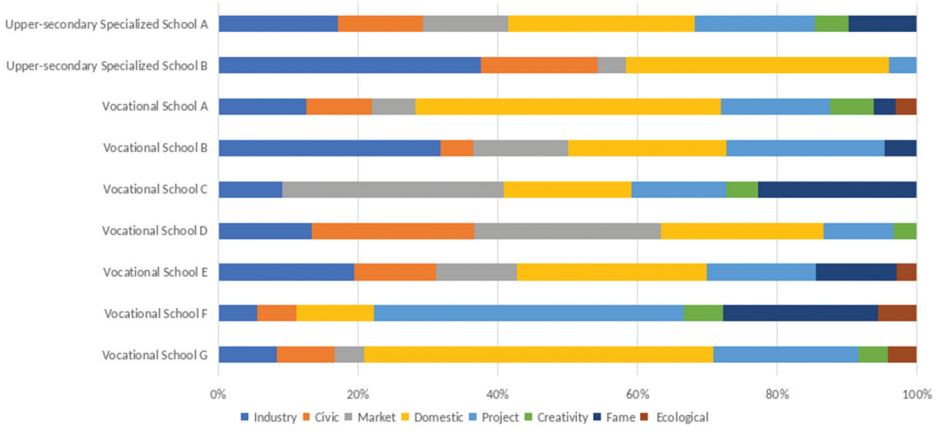

Figure 1. Percentage of use of codes per school.

Domestic justifications: pedagogy fostering individualised learning and schools as teaching-based collaborative learning sites and

The results regarding the Table 2 the inventory of terms reveal that the *domestic convention* is the most dominant one (31% share across all schools). In terms of domestic legitimations, school leaders did not refer explicitly to the aspects of tradition, trust connectedness, and social aptitude. Instead, nearly all school leaders focused on the aspect of pedagogy, which is also the most frequently mentioned word of the whole inventory. Developing a pedagogical concept is the main goal, as vocational and upper secondary specialised school leaders, stress. A good example is provided in an interview with the school leader from Vocational School A:

> We don't innovate simply for the sake of innovation (. . .) but we put the learners at the centre. We are very much concerned with pedagogy, with 'what makes sense'.

According to the inventory of terms other important terms in the context of a domestic legitimation considering pedagogy were learner-centred, self-organised or individualised learning. as the school leader from Vocational School A stressed:

> Through (. . .) digitality, but simply through our concept, the learners have the opportunity to work more independently, individualised, and this has also given the teachers more time to support individual learners who may not be able to follow along so well, to coach them. This was previously less possible in the classroom.

Apart from pedagogical aspects school leaders refer to schools as learning communities. Several school leaders stressed that digital change requires a common effort. For example, the school leader at Vocational School E explained that to implement the aims regarding digitalisation, all members of the staff had to collaborate. A similar justification was found in the interview with the school leader from Upper-secondary specialised school B, who stated that a school leader has to bring the whole school on board for digitalisation. Another school leader told in the interview how a comprehensive BYOD strategy was implemented at their school actively involving the teachers in the decision-making process:

Table 2. Results regarding the inventory of terms for the conventions.

Convention	Terms	Counting	Schools mentioning the terms
Civic	Social responsibility	0	
	Social engagement	0	
	Fairness	4	Vocational school D
	Equality/Justice/equal opportunities	4	Vocational school E
	Society/social participation	4	Upper-secondary specialised school B Vocational school D
	State (Switzerland)/state requirements and policies	4	Vocational school D Vocational school E
	Canton/cantonal requirements and policies	11	Upper-secondary specialised school A Upper-secondary specialised school B Vocational school D Vocational school G Vocational school F
Industry	Efficient/efficiency	6	Vocational school A Vocational school B Vocational school E
	Expert knowledge	0	
	Competence/competent	8	Upper-secondary specialised school B Vocational school A Vocational school B
	Performance	0	
	Professionalism/Professional	2	Upper-secondary specialised school A Upper-secondary specialised school B
	Plan/Planning	2	Upper-secondary specialised school B Vocational school D
	Measurability	0	
	Norm	0	
	Functionality	0	
	Facilitation	3	Vocational school A Vocational school D
Domestic	Tradition	0	
	Community	6	Vocational school A Vocational school D Vocational school E
	Trust	0	
	Connectedness	0	
	Character/Personality development	0	
	Social aptitude	0	
	Pedagogy/pedagogical	36	Upper-secondary specialised school A Upper-secondary specialised school B Vocational school A Vocational school B Vocational school C Vocational school D Vocational school G
	Didactics/didactic	3	Vocational school B Vocational school D
	Learners at the centre/People at the centre	1	Vocational school A
	Self-organized/individualised learning/ differentiation	7	Vocational school D Vocational school G Vocational school F
Market	Competition/Competitive	2	Vocational school A Vocational school C
	Costs	0	
	Funding	0	
	Supply and demand	0	
	Economy/economic	4	Vocational school A Vocational school D
	Money	9	Upper-secondary specialised school A Vocational school C Vocational school D Vocational school E Vocational school G

(*Continued*)

Table 2. (Continued).

Convention	Terms	Counting	Schools mentioning the terms
Project	Project	24	Upper-secondary specialised school A Vocational school A Vocational school G
	Flexible/Flexibility	0	
	Exchange	1	Upper-secondary specialised school A
	Mobility/distance learning	6	Vocational school F
	COVID-19/Pandemic	10	Vocational school A Vocational school C Vocational school D Vocational school E Vocational school F
Creativity	Inspiration/inspirational	0	
	Motivation	1	Upper-secondary specialised school A
	passion	0	
	Creativity/Creative	2	Vocational school D
	Innovation/Innovative	3	Upper-secondary specialised school A Vocational school A
Fame	Image	3	Upper-secondary specialised school A Vocational school F
	Prestige	0	
	Reputation	0	
	Proud/Pride	3	Upper-secondary specialised school A Vocational school A Vocational school C
	Visibility	0	

> However, we discussed it with the teaching staff and let the teaching staff help decide when the comprehensive introduction would take place and the teaching staff then voted in favour of the comprehensive introduction, but it was delayed by a year because the media concept had not yet been completed and the teaching staff then said that we first wanted the work on media concepts to be completed.

A digitally integrated school as a common learning process implies that a reorganisation of communication is going on. For example, Upper-secondary specialised school B sees the benefits of digitalisation in closer teacher collaboration, with an improved and – digitally driven – intensified interaction among colleagues.

Industrial legitimations: competences, skills and efficiency

In terms of *industrial* legitimations (19% share across all schools), two main argumentation strains were apparent. On the one hand, school leaders stressed the importance of providing learners with new competencies or advanced digital skills. For example, one school leader from Vocational School B justified the schools' digitalisation strategy using this argument:

> So, of course, it is also part of the training requirements nowadays that we give them the skills to use these tools in the area of communication or to deal with data protection and whatever else, over and above the traditional subject of IT, communication, and administration.

On the other hand, the second argument of the industrial convention was related to making teaching, learning, and organising schools more efficient since the inventory of terms reveals that efficiency was one of the most used terms. For example, one school

leader from Vocational School A saw the potential of digital technology in facilitating the correction of exams and used the term efficient:

> You can also do that (exams) digitally, and it also makes it easier for the teacher to correct more quickly. (. . .) So, you also try to make life easier for yourself, more efficient, and still effective.

In particular, generative artificial intelligence was perceived as a useful instrument for teachers to optimise (and change) the character of examinations since generative artificial intelligence could support the teacher in the formulation of appropriate exam questions, as the school leader in Upper-secondary specialised school B mentions. The school leader from Vocational School G explained that the organisation of teaching and learning can be improved regarding the subjects and the methodology by using digital tools, as students can submit their tasks to the teacher more easily using digital tools and are therefore given new tasks more quickly.

On the other hand, the potential for distraction in digital learning in the classroom is therefore considered to be high, as school leader of Upper-secondary specialised school B stated. Furthermore, the stress level for teachers is not shrinking but in contrary the rapidly changing technology is undermining their role as a teacher, as school leader of Vocational School E is pointing out.

Project legitimations: cooperation with firms, developing distant learning projects

The third often referred convention was the *project* legitimation (18% percentage share across all schools). School leaders arguing with the project convention did not explicitly focus on the aspect of flexibility. By contrast, they used the word project most often and introduced their internal digitalisation project during the interview. Two main argumentations were in the foreground. One argument is related to new ways of interacting with others and establishing and deepening a network are seen as essential. School leaders justify their activities and reforms regarding digitalisation with the importance of collaborating with other schools or – especially in the case of vocational schools – with firms. A cooperation and project with firms is described by school leader of Vocational School B like this:

> I think it's strange for apprentices to somehow switch from one world to another. In other words, what they are already used to in the company, they should also have to actively live it here (. . .). I think it's like an interplay, and that's also a good basis for cooperation in the reform project afterwards.

An additional example in fostering a project dimension and finding new ways of collaboration is given, when local presence or absence of the learners has to be rearranged. The school leader of Vocational School F describes a project on distance learning to support students in their careers (e.g. for sportive students participating in competitions outside the country). It should be ensured a more flexible schooling.

> But the spark came from the bottom, from the students, from their passions, from the fact that we have to be performant because in the near future, maybe we will rarely see these students in presence. In recent years, we have moved from one student following the school at a distance to more and more students following the school at a distance (. . .)

Another line of argumentation concerns the environment outside of schools, which also worked as strong incentives for digitalisation. School leaders of vocational schools, where learners are part- time in school and part-time at the workplace, emphasise that their schools have to be up to date with digital technologies since learners are confronted with the latest digital technologies in their apprenticeship and firms. For example, the school leader from Vocational School E explained:

> That's (digitalization) something that is a challenge, but it's not a question of yes or no, especially as a vocational school, but um in the training companies, the environment in which the learners move is also affected by it. (. . .)

Another aspect which enforced this reorientation of teaching and learning was the COVID-19 pandemic, which was – as several school leaders declared – a 'booster' in developing the digitalisation further and fostering innovative thinking in teachers, since learners had obviously more physical distance to vocational schools and firms, which was perceived as another external shock. As the school leader from Vocational School E put it:

> I feel you go along with the development. The pandemic has certainly contributed to this, but I see that people have gained an understanding through experience, so in my opinion, people are talking less about digitalization, i.e., the generic term, and more about the possibilities.

Market legitimations: following the dynamics of the market and competition

In the context of market legitimation (11% share across all schools), supply-demand, costs and funding were not explicitly mentioned. For sure the access to resources and money provided by the state for furthering the digitalisation were important. The most frequently used term for this convention was money. Fittingly, one main argument of the market legitimation was related to investment, resources, costs, and prices. This ranged from receiving funding from the canton to implementing strategies such as the bring your own device practice in schools, as the school leader from Vocational School G describes it, to preparing for the market and the economy. The school leader from Vocational School D emphasised that being up to date is important, even for the economic future of Switzerland. This statement goes beyond a market justification and even includes a civic dimension. Another school leader from Vocational School A described the close connection to the world of work as justification for their digitalisation efforts:

> We also keep pace with economic developments—we are the interface between school and the world of work, and we cannot be left behind.

The other argument refers to competition between schools. Some school leaders expressed the economic idea that competition between schools in terms of digitalisation improves and drives schools forward. Fitting to this line of argumentation, the school leader of Vocational School C stressed that schools have to be in a good position related to other schools and try to be the best:

> If we remain silent and do not say that we are good and that we are among the best, then we have not achieved our goal in terms of attitude.

The competition aspect presented in this quotation also shows that the convention of fame is another element which plays a role when something like a race to the top is part of an argumentation.

Civic legitimations: civic duties imposed by the state and fairness

The civic legitimation (11% share across all schools) was as well present, but none of the school leaders explicitly mentioned the terms of social responsibility and social engagement. The terms fairness and equality or equal opportunities were mentioned by two vocational school leaders. Schools are entitled to support learners for participating in society and workplace, that is why they have to catch up with digitalisation. For example, the school leader in Vocational School G was aware of a social gap concerning the bring-your-own-device strategy in their school, since not all learners can afford a digital device by themselves. Therefore, the school leader was ready to talk with the cantonal authorities about how to provide more digital devices for all learners in their school. Other school leaders, for example, the school leader in Vocational School E, stressed the potential to foster equality and fairness, since access to knowledge is much easier with digital tools than without them. Another mentioned aspect was, sensitising the learners to the dangers and opportunities of digital technology to ensure participation in society, as the school leader from Vocational School D was pointing out:

> I think that the digitalization gap could simply widen if the handling, the opportunities and also the dangers of digital devices were not addressed in compulsory schools and at upper-secondary level and the advantages and also the problem areas were not pointed out (. . .). Also, we are trying to realise the idea of fairness.

The state is regarded as an important player for schools' digitalisation. The provision of resources for IT infrastructure as well as aims to develop digitalisation further, i.e. to introduce BYOD in all schools are to be negotiated between schools and cantonal authorities, as school leaders point out. Thus, another relevant argument links to cantonal and national strategies and their implementation in schools. For example, the school leader in Vocational School E justified his commitment by explaining that he has to comply with a state mandate. He must therefore fulfil a civic duty, regarding Switzerland, being aware of the expectations of society and the canton as a client:

> So, we have the changes. We want to remain innovative – that is a requirement that Switzerland has, that our client also has.

Similarly, the school leader from Vocational School G explained that their bring-your own-device policy was an initiative from the canton. As well the school leader from Upper-secondary specialised school B stressed that meanwhile the cantonal strategy was focused on providing a good digital infrastructure, their school had the task to develop further the implementation by adding pedagogical elements in their digitalisation policy.

Vocational school leaders argued, that increased digitalisation would enhance the 'action competence orientation' as prescribed by the curriculum and national strategy of vocational education. These legitimations of school leaders emphasising the responsibility of their school towards the state or canton were coded civic, since the implemented aims in the school for a digitally competent citizen correspond to the state or cantonal strategy that has to be accomplished.

Furthermore, in the view of school leader from Upper-secondary specialised school A schools should provide a 'critical sense' in order to enable learners to use but also to assess the possibilities and pitfalls of digitalisation in the workplace and in society.

Convention of fame: publicity and reputation

Legitimations referring to *fame* (5% share across all schools) were only sometimes mentioned. The terms image and proud/pride were explicitly used three times each by the school leaders. Fittingly, the justifications of the school leaders are linked to their awareness as a leading school. Some school leaders were quite aware that they are seen as a role model regarding digitalisation in their schools. Their success and reputation in the educational world and in the public are very important and salient to them. For example, the school leader from Vocational School C indicated that he was not surprised that the data from our quantitative study marked his school as a leading pioneer in digitalisation:

> I would simply like to show you the philosophy and attitude of the company (school), which means that we have also become leaders in digital transformation or have something to show that can be seen, and when I see the scores there, it doesn't surprise me.

Another school leader from specialised Upper secondary specialised school A, founded in the year 2005, underlines that his school is rather young, but therefore 'the school is digital from the very start!'

Creativity legitimations: compassion and innovation

Regarding *creative* legitimations (4% share across all schools) all terms (motivation, creative/creativity, innovation/innovative) except passion and inspiration/inspirational were mentioned by the school leaders. Looking at the frequency, there are no major differences between the terms and it can be seen that all of them are mentioned relatively rarely compared to the terms for other conventions. School leaders who referred to this justification stressed their aim for a new and innovative learning culture. These schools emphasise the need to open up traditional teaching with digital tools and explore new forms of learning. School leader from Vocational School E highlighted the new possibilities and forms of examinations including artificial intelligence. The school leader from Vocational School D shared this point, that schools should be places of creativity by using digital devices and establishing an innovative teaching culture across different professions, which also overlaps with the project convention.

> So we are a bit like Google landscapes, and I can definitely see that in the future (. . .) that we (. . .) will then be the places of creativity, or that not all of them will be creative, but maybe a few will be, and not just the bakers, but the bakers together with the agricultural machinery mechanic will develop a new tool, but only those who really want to develop the new machine, or that's how the futuristic theorists see it, but I think that's possible with digital means.

The aspect of innovation is illustrated by the response from another school leader of Vocational School A:

> We've done a lot of work and have had a lot of disputes, but today we're very agile and innovative and simply courageous. (. . .)

To conclude, we can observe that creativity is seen in the context of digitalisation not so much as an individual task but also as a result of a common effort.

Ecological legitimation: a paperless school and twin transition

For the ecological legitimation (1% share across all schools) the term sustainability was mentioned three times. In essence, two arguments can be found. The first argument is related to the paperless school implying that that digitalisation is sustainable and resource efficient. For example, the school leader from Vocational School F describes how digitalisation has enabled the redesign of the premises, meaning that printers have been removed from the classrooms and replaced with one device in the staff room, which should be used rarely for sustainability reasons. Similarly, the school leader of vocational school E argues that digitalisation saves resources and means that teachers have to do less copying. This argument is also used by the school leader from Vocational School G:

> We are moving away from paper. That has clearly changed. (.) This is evident in the number of copies. In other words, we are moving away from it. That has changed dramatically.

Another aspect in the context of ecological legitimation is the twin transition where school leaders emphasise that digitalisation also fuels advancements in teaching sustainability and that agile methods used to implement innovations in digitalisation can also be helpful to establish innovative concepts in the area of sustainability. This legitimation is presented by the school leader from Vocational School A:

> We also have a sustainability competence area, where we try to generate various activities for the learners and also pass on something to them in this area. (. . .) It's not just digitalisation that is the focus, there are actually many other topics. I think digitalisation simply triggered this, and through digitalisation, we realized how this agile forward movement works and can also be extended to other areas.

A typology of digitalisation legitimations in vocational and upper-secondary specialised schools

The findings reveal that vocational and upper-secondary specialised schools focus mainly on pedagogical aspects based in the domestic convention to justify technology integration at their schools. In particular, school leaders emphasise the pedagogical value of digital technologies for teaching and learning aiming to foster self-organised learning, individualisation, and differentiation. Although vocational education schools and upper-secondary specialised schools use all different legitimations to justify digital transformation at their schools, several types of composed legitimations can be observed. Our typology-based content analysis of school leaders (Kuckartz 2016), representing a collective orientation (Kuhl, Strodtholz, and Taffertshofer 2009) leads us to mainly three types of schools in justifying digital integration. Since the domestic convention is the most relevant legitimation for school leaders this typology focuses on how school leaders combine their pedagogical justifications with the other most popular

Table 3. A typology of digitalisation legitimations in vocationally-oriented Swiss upper-secondary schools.

School Type	Schools
Domestic-industry	Vocational school B
	Vocational school E
	Upper-secondary specialised school B
Domestic-project	Vocational school A
	Vocational school F
	Vocational school G
	Upper-secondary specialised school A
Domestic-market	Vocational school C
	Vocational school D

conventions. We used the percentage of codes attributed to the school as an orientation and identified the most frequently mentioned convention next to the domestic legitimation. Next to the domestic convention, there were three most relevant legitimisations: industry, project and market convention.

In one case, i.e. Upper-secondary specialised school A, the project and industrial convention were used equally often in addition to the domestic convention. Therefore, the inventory of terms was used to identify, which convention was particularly relevant alongside the domestic legitimation. As illustrated in Table 2 the school leader explicitly referred to projects and exchange. Thus, the school can be categorised as a domestic-project type.

Table 3 depicts which schools belong to which type. We can state for the *domestic-industry* type (1) that these schools specifically emphasise the acquisition of digital competences for industry, as a learning goal and align the pedagogical use of digital technology in lessons accordingly.

By contrast, the school type *domestic-project* (2) highlights the pedagogical meaningful integration of digital technologies into teaching and learning to foster project-based learning with partners in and outside the school.

Finally, the *domestic-market* type (3) refers to pedagogical strategies in order to be more competitive with other schools. Financial resources and digital integration are seen in the light of being adaptive for the market.

Discussion of the findings in the light of critique of legitimations

The EC approach is exploring norms in specific contexts but also highlighting changing conventions – in our case in an institutional setting located in the field of Vocational Education and Training (see e.g. Verdier and Janmaat 2013). In this section we discuss the role of critique and how conflicts reveal the tension between different views and legitimations of actors which have the potential to transform institutions. Critique and conflicts lead to testing and challenging the prevailing assumptions and practices (see Boltanski and Thévenot 2006). Like other organisations, schools are 'places where different ideas of rightness and justice meet' (Elven 2025, 96). Such a confrontation makes therefore a transformation and a restructure of conventions 'permanently in negotiation' possible (96). Our typology (domestic-industrial, domestic-project and domestic-market) also reveals, that combinations of these justifications are conflictive, or the other way round, that conflicts give rise to hybrid justifications.

School leaders of the *domestic-industry type* (1) need to compromise between their pedagogical vision of personalised learning and vocational and work-based practices, in order to provide good teaching quality with digital tools but also fostering competences that are needed in the specific professions. Moreover, this type is torn between adapting to work-place affordances without neglecting pedagogical aspects. Some school leaders in our study even challenged the traditional role of teaching in classes and promoted a shift towards learning groups employing individualised learning with digital devices. The industry convention aiming at competences and qualifications for the workplace can be conflictive with pedagogical aims, which foster critical distance towards vocational practice. We are – as school leader from Vocational School B claims – in the first line a school, and digitalisation oriented towards firms, should not be an end in itself. Nonetheless, school leaders in vocational schools emphasise the importance of teaching digital skills for the workplace. The strong focus on firms and industry shapes the way how learning and teaching in schools should take place, i.e. as an action competence orientation towards practical performance, as school leader of Vocational School D is stressing.

School leaders of the *domestic-project type* (2) need to compromise between pedagogical ideas for their schools and possible collaboration partners. Workplace pressures especially affect vocational school leaders, who are expected to keep up to date with digital technologies and integrate them into meaningful teaching. These claims from the world of work as well as the pandemic as an external shock not only fuelled technology integration in vocational schools, but also lead to compromises because projects and potential cooperation determined the range for digitalisation. In terms of project legitimation school leaders from vocational education schools stress the close collaboration with companies, which ensure a smooth transition of the learners using digital tools in the school and at the workplace. Fostering projects and networking intensively with other actors were very welcomed by school leaders. However, loosening classroom teaching and overhauling traditional teaching and learning can cause conflict. Several school leaders report (Vocational School A and B) that conflicts emerged when digitalisation projects were announced or implemented. Digitalisation projects should enhance the quality of teaching and learning, but not all teachers were convinced by such goals, which were furthermore introduced quickly with lacking opportunities to adapt, as Vocational School leader E explained.

Finally, the *domestic-market type* (3) of school leaders is aware of financial constraints and needs to face these challenges to implement pedagogical innovations. Ideas of personalised learning and putting learners at the centre need to be adapted in order to ensure a school that can compete with other vocational and upper secondary specialised schools. School leaders referring to the market justification are well aware that they have to keep pace with economic developments in the world of work and innovations in companies. Also, a competition between schools was an issue. A tension between a response and quick reactions to market developments and technological change in contrast to planification and setting long-term aims for learning and teaching (as typical for schools) was spoken out by Vocational School leader E.

Exactly the balance of these different claims enabled vocational schools and upper secondary specialised schools to bring together and hybridise their profiles as domestic-industrial, domestic-project-based and domestic-market-oriented. We could also argue that the overall domestic legitimations, part of all three types, act as a shield in order to

protect schools from excessive skill-driven demands by industry, attempts to dissolve school structures and political and economic endeavours to spread radical marketisation strategies. For example, the school leader from vocational school A stresses the priority of pedagogical goals regarding opportunities to get access to funds:

> How could learning be made sustainable? We are trying to focus on this aspect and, if we can get support for it, because innovation always costs money, then we will seize the opportunity. But it is important to me that we take this approach and don't just say, 'Oh, there's another fund we could tap into, so let's see what we can do.' That would be the wrong approach in my opinion.

Another example were domestic conventions act as a shield against a mandatory and overall use of digital tools is provided by the school leader from upper-secondary specialised school A who argues that the pedagogical principle of free choice in teaching methods is enforced to avoid pressure on teachers in the handling of digital tools:

> Our only requirement is that teachers store all their teaching materials digitally. Apart from that, they are free to structure their lessons however they want. They can choose to use paper or not; they can do everything on paper or on their devices. We have that, so we have absolutely guaranteed freedom of teaching or freedom of methodology (. . .) So, they didn't necessarily have to use devices in class, and so, um, the atmosphere has actually always been good.

Beyond the domestic-industry, domestic-project and domestic-market type we also tackle the civic convention in this discussion in more detail. Historically, civic values were more prominent for vocational schools than today (see Bonoli and Gonon 2022). Most school leaders referring to the civic legitimation emphasised the mandate of the state and canton. For example, some school leaders argued that digitalisation supports them in implementing the national 'action competence orientation' curriculum for vocational education. Thus, a combination of general knowledge but also specific knowledge for the current professional practice should be taught in vocational schools, enabling active engagement in the world of work and society (Degen et al. 2019). In addition to such a mandate of the state and cantons, to implement an action-oriented and competency-based syllabus, school leaders also argue that digitalisation can contribute to equal opportunities among learners. They mention not only a lack of access to digital technology, but also the varying digital skills of learners, already acquired and brought along. Schools should instead be working to bridge this digital divide, especially among disadvantaged learners, as school leaders from Vocational School D emphasise.

Contrary to previous studies (Frei, Steinberg, and Kenneth 2023; Steinberg and Schmid 2023) our research shows that creativity convention is rather of minor importance in the legitimatisation of digitalisation at school. Already Horvath, Steinberg, and Frei (2023) identified a conflict between the school world of standardised tests (industry convention) and the school world of creativity and self-fulfilment (creativity convention). Moreover, Horvath, Steinberg, and Frei (2023) stressed that artificial intelligence will rather enhance efficiency than disrupt traditional domestic norms or boost creativity. Fittingly, school leaders in our study (vocational school A and E) highlight the important role of artificial intelligence in exams and the promise to reduce the workload of teachers.

In summary this study confirms the decline of the importance of the civic convention and the minor role of the creativity convention. Our typology reveals the role of a strong

pedagogical legitimation combined with industry, project and market in the context of digitalisation in vocational schools. Furthermore, a stronger orientation towards market and industry garnished with pedagogical justifications (domestic convention) seems to be obligatory, when reforms, driven by efficiency (industry convention), competition (market convention) and cooperation with firms (project convention) are on the agenda.

Limitations

This explorative study has its limitations, one of which concerns the sample. Only school leaders of vocational and upper-secondary specialised schools, which had a high reputation in terms of digitalisation or were as a result of our study identified as most advanced in active teaching and learning were interviewed in this study. Thus, the findings cannot be generalised to average and less digitised schools. In this study, only specific schools with high technology adoption were investigated, which can be considered 'extreme cases' (see Schreier 2020, 23–26). Moreover, the study was set in a Swiss context and therefore generalisations to other (vocational) schools in other countries should be treated with caution. Furthermore, this study aimed to specifically focus on vocationally oriented schools, which fully fits for the vocational schools in Switzerland. The upper-secondary specialised schools, however have a broader profile, in offering also a general education track. Thus, a further limitation is the exclusive view of school leaders, which only represent one perspective.

Conclusion

To push digital integration forward, the selected schools of this study – relatively – early adapted digital devices. This 'explorative engagement' (Auray 2016, 42), is driven by the promise of a more efficient school organisation and enhanced personalised learning. As stated in other studies (see Steinberg and Schmid 2023), in our case, the project dimension is part of the profile of digitally advanced schools. Most are actively collaborating with other stakeholders, having specific contracts regarding the digital infrastructure of the schools, or in having exchange with other innovative projects (or schools).

School leaders have to balance out several affordances, which represent different worth orders and are in conflict: to optimise efficiency, make schools more marketable, strengthen collaborations and foster individual learning. Insofar civic legitimations, as one of the founding principles for establishing vocational schools (see Gonon and Christian 2025) loose some ground. On the other hand, a domestic legitimation, which foster the pedagogical dimension of schooling is still a dominant principle, which is, combined with market, industry or project values, pivotal in unifying divergent – and even contradictory – legitimations. Digitalization is not limited to vocational schools, but is much more prevalent in the world of work. Thus, vocational schools and school leaders must also explore new ways of interacting with firms, which challenge domestic norms, efficiency but also project dimensions of worth.

Our qualitative study reveals trends that will also spread in other vocational schools and determine the education policy in intensifying digitalisation in schools in the near future. If neo-liberal personalities stirred by global digital companies really emerge from such an ongoing digitalisation in schools as Ball and Grimaldi (2022) warned, it is

uncertain, since schools will struggle with bringing together traditional teaching and learning with new forms of digital integration in a changing economic and political context. Thus far, schools are correctly stressing the basic pedagogic principle, which should be the firm ground for digitally driven reforms as urged by economic and policy actors. Hence, they cool out over-emphasised promises or gloomy prognoses of digital heteronomy (c.f. Kabaum and Anders 2020, 318).

Note

1. Vocational schools in Switzerland are part of the VET-system and complement instruction and learning at the workplace. Vocational schools are part-time schools. On the other hand, upper secondary specialised schools are full-time schools and integrated in the general education schools, but with a vocational orientation. Both school-types are located on a secondary II level (see Wettstein, Schmid, and Gonon 2017).

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