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What knowledge counts—boundaries of knowledge in cross-institutional curricula in higher education

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Abstract
The aim of this study was to explore knowledge in the context of creating a shared curriculum between research-intensive and vocationally oriented universities of applied sciences. Curriculum knowledge was explored from the accounts of 26 teachers from four institutions in Finland. Shared curriculum initiatives created an environment in which teachers were obliged to negotiate and make explicit their approaches to curriculum knowledge and knowledge practices. The phenomenon of blurring boundaries is approached with Bernstein's sociology of education. The present findings show that institutions have a distinct foundation for curriculum knowledge, but cross-curricular initiatives brought pressure to change towards the knowledge practices of the other institution. Discrepancies were found between knowledge and learning outcomes, and between knowledge as a negotiated artefact and knowledge as enacted in curriculum implementation. Curriculum knowledge emerged with symbolic boundaries and an invisible pedagogic order. This resulted in practices where the official discourse appears to have similar learning outcomes, which are not similar from the perspective of knowledge. Focus on a harmonised degree, as stated in the European qualification framework, obscures the question of knowledge and requires more attention. This is especially the case if the boundaries between degrees and institutions are purposely weakened. If the rationale to weaken the boundaries is on the streamlined educational processes and their efficacy, there is a risk of gaps in knowledge provided for students in the higher education.

Keywords Knowledge · Curriculum · Cross-institutional · Bernstein · European qualification framework (EQF)

Introduction

The question of curriculum knowledge is topical, as it defines the goals of higher education and the access it provides (Shay, 2016; Young, 2013). It is often assumed that education at research-intensive universities relies on the scholarly aims of hierarchical, specialised, and

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symbolic knowledge, whereas vocationally orientated higher education institutions (HEIs) emphasise the practice-orientated knowledge needs of working life, focusing on applicable and useful knowledge (e.g. Isopahkala-Bouret et al., 2011; Shay, 2013). Nevertheless, several scholars have questioned if this is an over-dichotomised view (e.g. Muller & Young, 2014). Previous research has shown that institutions, regardless of level of prestige, do not guarantee the level of curriculum knowledge; rather, it is a question of curricular knowledge practices (Clegg, 2016; McLean et al., 2013; Muller, 2009; Shay, 2013). However, little is known about what happens to knowledge when HEIs with different epistemic orientations and knowledge interests create a shared curriculum. It is a topical question, as curriculum collaboration has been promoted across the boundaries of HEIs (e.g. Brady, 2015; Ertl, 2020; Williams, 2017). This phenomenon of 'blurring the boundaries' provides the motivation for the present study to explore knowledge in the shared curriculum of two types of HEIs in Finland.

This study examines curriculum knowledge in undergraduate education that is provided in two different types of HEI. Curricula were reformed to include partial sharing (80–120 credits [cr][1]) between a research-intensive university (RIU) and a vocationally oriented university of applied sciences (UAS), although students continue to graduate from different degree programmes and institutions. Both universities follow the European qualification framework (EQF) at the same level, but their differences in curriculum and educational roles have been highlighted in Finland (e.g. Isopahkala-Bouret et al., 2021).

Formally, all HEIs in the European Higher Education Area have uniform degree structures and harmonised qualification requirements as stated in the EQF. The qualification levels (1–8) feature an increasing complexity of learning outcomes and apply similarly to different types of HEIs (EQF, 2018). For example, all bachelor's degrees are expected to have the same level of complexity, regardless of the institution at which they are completed (Table 1). However, the domains of 'knowledge', 'skills', and 'responsibility and autonomy' may have a different emphasis in HEIs with a more academic, vocational, or professional orientation (EQF, 2018).

Extensive research related to the Bologna process is available, of which the EQF is part (e.g. Klemenčič, 2019; Vögtle, 2019), while some research concerns the convergence of different types of HEIs (e.g. Haukland, 2020; Ljungberg & McKelvey, 2015). The EQF entered HEIs from the outside, not with the force of law but with the force of persuasion (Brøgger, 2019), leaving room for interpretations by HEIs in their context (Friedrich et al., 2016; Isopahkala-Bouret et al., 2011). However, to date, research on curriculum knowledge is scant; in particular, its complexity at the *same* EQF level at *different types* of HEIs has not received attention. At least three concerns have emerged. First, if HEIs may differ in emphasis, either more academic or vocational, what happens to knowledge when curriculum collaboration crosses institutional boundaries? Second, if HEIs of different types are expected to have the same 'level of complexity', how is it interpreted in this case? Third, if knowledge is understood as a domain or column separate from other forms of knowing, does this limit our understanding of knowledge in the higher education curriculum?

Research on curriculum knowledge and how it is differentiated in higher education has been most active in the South African context and later in the UK, Australia, and Norway (e.g. Brady, 2015; Clegg, 2016; Maassen et al., 2018; McLean et al., 2013; Muller &

[1] In this paper, credits refer to the European Credit Transfer and Accumulation System (ECTS). ECTS is a standard means for comparing academic credits (EU 2015). One credit is equivalent to 25–30 h of a student's work. One academic year corresponds to 60 credits, consisting of courses worth e.g. 5 credits each.

Table 1 Learning outcomes for bachelor's degrees (level 6) (EQF, 2018)

	Knowledge	Skills	Responsibility and autonomy
Level 6	Advanced knowledge of a field of work or study, which involves a critical understanding of theories and principles	A comprehensive range of cognitive and practical skills required to develop creative solutions to abstract problems	Managing complex technical or professional activities or projects, taking responsibility for decision-making in unpredictable work or study contexts, and for managing the professional development of individuals and groups

Young, 2019; Shay, 2013, 2015; Wheelahan, 2009; Wolff & Luckett, 2013; Yates et al., 2017). In post-apartheid South Africa, several university mergers occurred, followed by a new curriculum policy to emphasise widening the access to education, whereas, in anglophone countries, qualification frameworks and outcome-based education emerged through an employer-driven approach (Young, 2008). Fourteen years ago, Michael Young reported that Nordic traditions of education were largely immune from pressure to develop the kind of outcome-based qualification frameworks found in anglophone countries. Today, the situation is different. In Finland, like other European Union member countries, the EQF framework with employer-driven 'learning outcomes' and 'competencies' has become mainstream in higher education policy, university strategies, and curriculum discussions. In these discussions, the question of knowledge is almost invisible (cf. Petkutė, 2016). Maton (2014) called this knowledge blindness.

In this study, curriculum knowledge is understood broadly, reflecting the epistemological assumptions behind curriculum choices in educational change. Knowledge is socially produced and acquired in a particular historical context while having properties that take it beyond present interests and practices (Young, 2008). Thus, the curriculum is approached here not only as an actual curriculum corpus and documents, as in several earlier studies where knowledge has been analysed (e.g. Shay, 2013; Wheelahan, 2007), but also as a dynamic and social process that includes meaning-making in communities, which is also depicted as 'complicated conversation' (Pinar, 2004, p. 185). Therefore, curriculum knowledge is explored primarily from the accounts of teachers. Shared curriculum initiatives created an environment in which teachers from different types of HEIs were obliged to negotiate and make explicit their approaches to curriculum knowledge and knowledge practices.

The objective of this study is to explore what happens to knowledge in the shared undergraduate curriculum of two different types of HEIs. The relationship between curriculum knowledge and the harmonised qualification requirements, as stated in the EQF, will be discussed. The following questions guided the analysis: how are different forms of knowledge legitimated when creating a shared curriculum between two HEIs of different type, and what kinds of boundaries and differentiation can be identified?

Pedagogic device: the meaning potential of curriculum knowledge

The dynamics in the curriculum-making process and decisions on knowledge can be characterised using Basil Bernstein's (2000) 'pedagogic device' that regulates the potential discourse available to be pedagogised. It models relationships between three hierarchical fields: *production*, where new knowledge is created; *recontextualisation*, where knowledge

is transformed into a curriculum with certain meaning potential; and *reproduction*, where knowledge is taught to students.

Field of production refers to research-based intellectual activity (systematic knowledge), which is different from everyday knowledge. Bernstein (2000) characterised the nature of everyday knowledge with *horizontal discourse* that is segmentally organised, is highly dependent on social context, and thus lacks coordinating principles in the integration of meanings. *Vertical discourse* refers to specialised, symbolic, and scholarly knowledge that 'takes the form of a coherent, explicit, and systematically principled structure' (p. 157). Horizontal discourse features context-bounded and practical knowledge, whereas vertical discourse features context-free and systematic knowledge. In the field of production, *distributive rules* regulate different forms of knowledge and thus control the relationships between power, social groups, the forms of consciousness and practice, and what is thinkable and non-thinkable (Bernstein, 2000).

In recontextualisation, where knowledge is transformed into a curriculum with certain meaning potential, *recontextualising rules* are implemented. Selection happens from the body of knowledge in the field of production. According to Bernstein (2000), this phase creates a space for ideologies to play. Different forms of realisation can either restrict or enhance the potential discourse available to be pedagogised, depending on the 'orders of meaning' or logic guiding the process (Shay, 2013). The field of recontextualisation emerges as varied curriculum types, models, and processes.

In reproduction, the teaching–learning encounter provides frames for students' eventual attainment, and *evaluative rules* condense the meaning of the pedagogic device (Bernstein, 2000). Pedagogic practise requires continuous evaluation of the knowledge transmitted and acquired. Thus, all three fields are hierarchical and interrelated, creating a site for exercising the power to regulate the forms of knowledge accessible by students.

Boundaries between HEIs in Finland

The divide between academic and vocational, context-free and context-bounded, and 'pure' and 'profane' knowledge has a long history in curricular debates (Young, 2008). I approach this divide with Bernstein's concept of *boundary*, referring to 'the social arrangements and practices whereby social groupings or domains of knowledge and experience are kept separate' (Atkinson, 1985, p. 27). To explore the knowledge boundaries across diverse institutional levels and contexts, I also use the concept of *classification* (Atkinson, 1985; Bernstein, 2000). By classification, Bernstein (2000) refers to the relationship and strength of the differentiation between the external, for example, between institutions and other stakeholders. External boundaries define what is included and excluded, reflecting power relations that create, legitimise, and reproduce boundaries (Bernstein, 2000). The levels of classification can range from strong to weak. In strong and weak classifications, things must be kept apart and brought together, respectively. Bernstein (2000) emphasised that the question of power would arise here: in whose interest would be the apartness or integration of things?

The apartness of HEIs has been clear in Finland, in 14 RIUs and 24 UAS, with different tasks based on legislation (Minedu, 2021). The tasks of RIUs include independent academic research, research-based highest education, and interaction with the surrounding society (Universities Act, 2009/558). The tasks of UAS are to educate professional experts on the needs of working life and conduct RDI activities to promote industries, businesses, and regional development (Universities of Applied Sciences Act, 2014/932). All HEIs are

funded by the government and free from tuition fees. HEIs in Finland follow European three-cycle degrees but have some specific features. At UAS, the standard degree is a vocationally orientated bachelor's degree that awards a professional qualification, but professionally orientated master's degrees have also been offered separately since 2005. At RIUs, students pursue bachelor's and master's degrees as a single entity. Bachelor's degrees completed at a RIU are mainly considered a stage of studying for a master's degree. Doctoral degrees are available only at RIUs.

The harmonisation of degrees in Europe weakened the formal boundaries between institutions, even though the local language makes them visible. For example, the concept of 'university' is not used of UAS in the Finnish language. The literal translation is 'vocational/professional higher education', and that of bachelor's degree is 'polytechnic degree', and a master's degree is 'higher polytechnic degree'. In UAS, there are no professor positions, but principal lecturers or senior research scientists may have similar qualifications as, for example, an associate professor or professor, and the scope of their roles in applied research has been increasing. Even though the statuses of RIUs remain high, the reputation of vocational higher education as a site of work and education is also good. After basic education, the vocational track has steadily gained popularity, as there are no 'dead ends' in the Finnish educational system, and an increasing number of students with vocational school backgrounds continue at UAS (Minedu, 2022).

Since 2010, several mergers of HEIs of similar type have been implemented, and more recently, also the former strong boundaries between RIU and UAS have been reconsidered (Williams, 2017). As a result, LUT University, the University of Lapland, the University of Oulu, and Tampere University became the owners of local UAS and formed a consortium. To date, mergers concerning instruction and degrees are not permitted by law, but 'discussions are underway about removing this restriction' (Williams, 2017, p. 48). According to Williams (2017), collaboration, alliances, and merges seek to enhance academic performance, achieve economic efficiencies, and align HEIs with the needs of the public. Recent alliances and collaborations have been backed by performance funding from the government, and thus in education policy, there is interest to weaken the boundaries. The government steers and finances the activities of HEIs, but HEIs are still autonomous actors responsible for the content of their education; especially in RIUs, academic freedom in teaching is strong. Therefore, compared with decisions to unite organisations and their resources, such as libraries, weakening the boundaries in instruction-related activities is much more complicated (Stein & Short, 2001).

Data and analysis

To find suitable cases for study, a request was sent to a mailing list of RIU heads of studies to find out if they had curricular collaborations with the UAS. Six of the 14 universities reported having cross-institutional curricular collaborations. Two universities with the most study credits in their shared curricula for undergraduate degrees were contacted, one to represent humanities, arts, and social sciences (HASS) and the other to represent science, technology, engineering, and mathematics (STEM; Table 2). The cases come from two locations where a RIU and UAS have been recently organised into the same consortium.

The study followed the guidelines of the Finnish National Board on Research Integrity and General Data Protection Regulations. No sensitive data were collected. Written

research permissions were obtained from all the HEIs and volunteer informants. Information about the shared curricula documents was collected from the degree programmes and their web pages. Curriculum documents (241 pages) were used as secondary data, whereas interviews were used as primary data. Semi-structured narrative interviews (Mann, 2016; Squire, 2013) were conducted with 26 teachers who volunteered: 13 from the RIU and 13 from the UAS (14 from STEM and 12 from HASS). Twenty of the informants had teaching positions (professors, lecturers, and instructors), and six had leadership or administrative positions. Ten had doctoral degrees (seven from the RIU and three from the UAS), and 16 had master's degrees (six from the RIU and 10 from the UAS). Altogether, 16 of the 26 informants reported being involved with research activities (nine from the RIU and seven from the UAS).

The thematic interviews followed a structure of the curriculum change process: from the starting phase towards the experiences and views on the curriculum-making and how the curriculum was or will be implemented in teaching. Throughout the interview, the focus was on knowledge and knowledge practices, with questions on, for example, the form of knowledge they saw as important to include in shared curricula, how they succeeded in doing it, and how they make choices on knowledge in their teaching practice. In the preliminary information form, the informants were asked about the course curricula in which they had been engaged, and the documents were examined before the interview. If any discrepancy in curriculum texts between the two HEIs was found, informants were asked for their views on the texts. Concrete course examples facilitated an understanding of the question of knowledge, which might be too abstract to discuss. The recorded interviews lasted for 54 min on average and were transcribed into 287 pages.

The methodology is guided by Bernstein's (2000) notion of the necessity of engaging theory with empirical reality. He draws a distinction between the internal language of description, which refers to the language of concepts and theory, and the external language of description, which refers to the empirical world. Languages of description have similarities with content analysis, but content analysis produces, according to Bernstein (2000), 'apparently self-announcing contents' (p. 136); the principles of languages of description translate the empirical referents and their mutual relations into conceptual relations. Next, I describe the ways in which I translated the concepts (the internal language of description) into a set of themes (the external language of description with which I read the data). First, the interview data were coded using the Atlas.ti software to identify all types of empirical referents of knowledge. Next, the analysis focused on descriptions where the informants (1) talked about the knowledge that they consider important to be included and the origin and legitimation of this knowledge (the field of knowledge production), (2) talked about the decisions on knowledge and knowledge practices in curriculum making (the field of knowledge recontextualisation), and (3) evaluated the student's attainment (the field of knowledge reproduction). The notions were summarised in a table with separate columns for the RIU and UAS to compare the institutions. The empirical referents were reflected in the conceptual framework of this study, focusing on the boundaries of curriculum knowledge between the two HEIs. Finding connections between internal and external languages required returning to the theory and data several times as intertwined processes. Next, the findings are reported. Citations from the data were coded with the institution (RIU/UAS), disciplinary field (HASS/STEM), and the number of interviewees. The fields of pedagogic devices are used to structure the results.

Table 2 Cases from the RIU and UAS

	RIU	ECTS	YEARS	UAS	ECTS	YEARS
STEM						
Degree programme	Civil engineering	300	5	Construction engineering	240	4
Pursued degree	Bachelor of Science (Technology) Master of Science (Technology)	180 + 120	3 + 2	Bachelor of Engineering	240	4
Shared curricula	80 of 180 cr			80 of 240 cr		
HASS						
Degree programme	Tourism research	300	5	Degree programme in tourism	210	3.5
Pursued degree	Bachelor of Social Sciences Master of Social Sciences	180 + 120	3 + 2	Bachelor of Hospitality Management	210	3.5
Shared curricula	Possibility of 120 of 180 cr			Possibility of 120 of 210 cr		

Boundaries of curriculum knowledge in the field of production

The origin of curriculum knowledge, emphasised by the RIU and UAS, were topics that the informants discussed during curriculum making. Informants' talk reflects the 'pure' and 'profane' division between the knowledge interests in different HEIs, as expected. The analysis revealed distinct distributive rules, creating a basis for curricula, with emphasis on context-bounded and practical knowledge at UAS and context-free and systematic knowledge at RIU (Fig. 1).

Often teachers compared their approach with the other institution. The curriculum knowledge at the UAS was based on an 'ideology to develop' and 'ideology to apply' (UAS-HASS-2). The comparison with the RIU consisted of stressing the development rather than research and application rather than knowledge as an intrinsic value. Understanding and applying knowledge are considered important when solving the practical problems of a professional field. At the UAS, knowledge was depicted as practice-based, industry-related, professional, and contextual knowledge: 'basic knowledge' such as business expertise in tourism or project planning in construction, or, as one informant put it, 'We do not strive for the highest wisdom but practical wisdom' (UAS-STEM-5).

UAS informants depicted that the order was from theory to practice: 'We need a heap of theory at the beginning, but then, straight away, how to apply it is required' (UAS-STEM-1). This informant referred to 'theory' by giving as examples the concepts of 'delayed penalty' and 'working day'. The informant explained how a delayed penalty depends on how the working day is defined by law and regulations. These concepts originated from practice and were thus theoretically weak (Shay, 2013). The informants themselves reflected that 'theory' has a different meaning in HEIs. At the UAS, theoretical knowledge depended on its social context and relevance. Curriculum knowledge follows trends and weak signals and is more flexible than knowledge at the RIU, where it is bounded to people and their special research areas. At the UAS, teacher expertise was not similarly based on research as at the RIU:

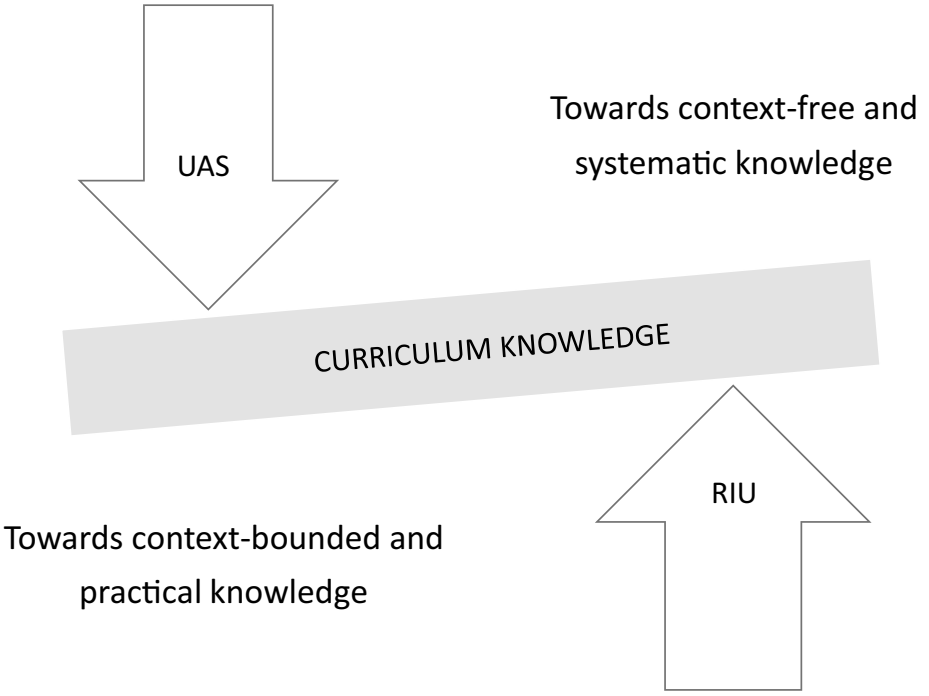

Fig. 1 Distributive rules in defining curriculum knowledge

> Their courses are very personified: a teacher's expertise in this, s/he does research on it, and the course is what s/he teaches. There was not much to… well, we would rather have an approach that, okay, what are the competencies a bachelor of hospitality management needs for their work? We try to start from that. (UAS-HASS-1)

Knowledge is considered legitimate when it can be formulated as competencies that serve the needs of the industry and the field of work. Engineering follows several standards, which require knowledge of how to apply them in practical contexts, requiring professional knowledge from the teachers. This features a weak classification between UAS and working life, followed by context-bounded knowledge.

In the RIU, the order between theory and practice was different from that in the UAS; the aim was to move from practical experience and questioning towards theoretical discussions. For example, in HASS, the aim is to examine certain tourism phenomena in light of societal, economic, and cultural frameworks, or in STEM; the aim is to discuss moisture damage in light of recent research. The process entails moving from specific and concrete cases or experiences towards abstractions and generalisations with meanings that are less dependent on context (cf. Maton, 2014). Teachers at the RIU accepted the relevance of working life in the higher education curriculum, but its role in knowledge production was different:

> At UAS, they often think that if teaching is research-based and theoretical, automatically it means that there is no collaboration with working life. But we have a lot of

> collaboration with working life. We have visiting lecturers, commissions, and go-to visits and so on. But at UAS, it is the starting point for everything. (RIU-HASS-2)

RIU teachers considered important a broader research-based understanding and academic freedom behind teaching and the possibility of leading the way, even though the industry had expectations for certain types of knowledge. They characterised their knowledge interests using their UAS equivalents as a point of reference but emphasised systematic and context-free knowledge, as exemplified in the following:

> The key difference, as I see it, is that our students need to know how to question and approach critically but constructively, and by doing so, develop society. This is the broadest level I think this degree should produce. Then, at UAS, they take an approach of 'this is how society is', or they do not even talk about society but instead say, 'this is how this [professional] field is'. These are the competencies with which you get along. (RIU-HASS-5)

Thus, RIU teachers assumed that UAS education would not provide students with the ability to critically question knowledge but would enable them to follow it. RIU students would gain more theoretical background knowledge through which they would be capable of, for example, evaluating standards and later renewing them. RIU teachers admitted that UAS students are much better than RIU students in professional practice at the undergraduate level. The question to be answered at the UAS would be 'how', whereas, at the RIU, it would be 'why' and would require relying on knowledge similar to vertical discourse.

Informants emphasised that even though the HEIs and degrees are approaching each other, they have the different foundation for knowledge. This should not be neutralised, as both have a value. Their distinct value is also recognised by employers (Isopahkala Bouret et al. 2021). Yet teachers at either type of HEI experienced a shift in knowledge requirements towards the knowledge practices of the other HEI.

Boundaries of curriculum knowledge in the field of recontextualisation

The aim of having a shared 120 cr in HASS curricula originated from a decision in consortium management, whereas in STEM, the curriculum collaboration began from inside the degree programmes without a set number of required credits but was equally encouraged by the consortium management. Thus, the cross-institutional collaboration relied on soft governing and consent, as Brøgger says, 'the governed *want* what they *have* to do' (2019, p. 176). When knowledge was recontextualised into the curricula, descriptions of the intended learning outcomes were negotiated and written into documents. The recontextualisation rules construct official knowledge and its relation to pedagogic practice (Bernstein, 2000). Next, the principles and orders of meaning that regulate knowledge are reported from the perspective of *language* and *contents* both featuring knowledge boundaries in the field of recontextualisation.

Language variation was topical in Bernstein's early writings on symbolic boundaries and codes, as language expresses 'orientations to means, ends and objects, the relation between the objects, the creation and re-creation of identities, and modes of social control', as summarised by Atkinson (1985, p. 40). Language sets limits and creates possibilities. In STEM, a shared curriculum was created for 80 cr with almost identical learning outcomes and course titles. Basic and introductory studies in the professional field with seemingly shared content knowledge were chosen for collaboration, for example, Introduction to Municipal Engineering and Introduction to Geotechnical Engineering. Titles in Finnish

were similar, but their English translations reflected some knowledge-related differences. For example, the fundamental concepts of 'construction engineering' and 'concrete structures' at the RIU were translated as 'building construction' and 'concrete techniques' at the UAS, respectively.[2] The language difference was probably unintentional as the HEIs had different platforms for their documents. Finding the differences was a by-product of searching for the correct translations for this paper. However, the concepts used at the UAS reflect a more practice-based and set approach to knowledge than those used at the RIU.

Knowledge differentiation in the shared curricula was feasible because of the unconnected implementation of the curriculum in STEM. The curricula were implemented separately at the two HEIs, except for one 5-cr course, and access to similar knowledge remained largely unsolved. In HASS, the curriculum for 120 cr was planned and implemented in collaboration. In HASS, language was used intentionally to differentiate between the two HEIs, as follows:

> We thought that the 120 cr shared curriculum is not fully possible because it blurs the degrees. We defined that we can offer something, some shared courses and some optional, to achieve the required 120 cr. What was left outside of that were our own, compulsory courses for our students, and these courses were very different from the shared ones, the difference was even highlighted. We emphasised it with names and contents so that it is easy to recognise we have two distinct degrees (RIU-HASS-1).

Compulsory, optional, and shared courses, as well as courses that are not included in the shared curriculum, feature stronger systematic research-based knowledge in the RIU-led course curricula than the practical and development-oriented knowledge in the UAS-led course curricula (Table 3). Both parties gave up some of their own courses and knowledge contents and relations. UAS teachers saw that the shared courses in the curriculum were more 'university-like' but mainly considered this an acceptable direction because it raised the standards. RIU teachers had doubts about whether their students would choose too many practice-based courses and not achieve the same level of theoretical complexity as before.

Next, the principles that regulate knowledge are reported from the perspective of content. Shared curriculum texts included lists of knowledge contents, which appear to play an important role in knowledge differentiation. Young (2008) stated that instead of a focus on knowledge contents, more relevant would be an analysis of the relationship between them. The findings show discrepancies between knowledge contents and learning outcomes, and between knowledge as a negotiated artefact and knowledge as enacted in curriculum implementation. Even though the original idea was to unite curricula and teaching comprehensively in STEM, this did not happen and contents played a role in this:

> When we moved on to discuss content, I got a feeling that we cannot help but end up with different implementations. We can write the shared learning outcomes fairly well, but the emphasis we have on competencies is different in both sides. (RIU-STEM-3)

In STEM, the lists of knowledge content were long and included differences between the HEIs. This was explained by the different lengths and cumulative logic of the

[2] Some examples of how the course titles differ in their English translation: Introduction to Structural Engineering at RIU—Basics of Construction Techniques at UAS; Introduction to Concrete Structures at RIU—Basics of Construction Techniques at UAS; Introduction to Construction Management and Economics at RIU—Basics of Building Economics at UAS.

Table 3 Examples of HASS courses

Main responsibility	Compulsory for all	Compulsory for RIU students	Compulsory for UAS students	Optional studies
RIU and UAS	Introduction to Tourism Phenomenon (RIU)/Orientation to Tourism Studies (UAS) Responsible Tourism Management			
RIU	Sustainable Tourism Planning	Cultural and Social Studies of Tourism Basic Course in Tourism Research*		Tourism in the Era of Environmental Crisis
UAS	Introduction to Business Skills in Tourism		Safety in Tourism Developing a Successful Tourism Business*	Customer Experience Management in Tourism

*Courses with a specific RIU/UAS profile that are not in the shared curriculum

undergraduate degrees and by the fact that RIU students continue to master's studies. The informants admitted that knowledge content might guide teaching more than the agreed-upon learning outcomes. This notion raises the question of how well learning outcomes can capture the nature of knowledge. Young (2008) and Erikson and Erikson (2019) questioned whether qualifications expressed as outcomes or standards can provide an adequate basis for teachers to develop curricula. Instead, these can lead to a collapse of standards and an extreme version of social constructivism that 'does away with the idea of the curriculum at all' (Young, 2008, p. 121).

Long lists of contents reflect the variation in the complexity of knowledge: what forms of knowledge are available, and how broadly or deeply students are engaged with that knowledge. However, the informants estimated that students in different HEIs may reach similar enough competencies on average to allow the substitution of credits if a student changes the HEI. This official discourse to ease students' flow through the degrees with cost-efficiency seemed to be one of the key rationales for the collaboration in STEM.

Even though the official discourse was similar, the students did not have access to similar forms of knowledge. At UAS, the same courses were implemented separately for those specialising in building construction, municipal technology, and property maintenance in smaller groups of 30–40 students. At university, they were implemented as mass lectures to about a hundred students:

> though there is a certain course title, nevertheless they teach something else [--] they had this trouble, that something needs to be taught before the students can continue to the next course, but always these contents did not fit the course description or any other course in this a kind of forced collaboration. We were stricter to following the shared mode, this is what we have, but if they need, they can do whatever application (RIU-STEM-7)

Contrary to that in STEM, the delivery of a shared curriculum in HASS was implemented in mixed groups, and all students had access to similar knowledge. Knowledge contents played a role but appeared differently from STEM: they were depicted very briefly in curriculum documents, often in a few words. The informants described that the knowledge would become real in the teaching phase: when they began to plan to teach with teachers from the other HEI, their roles, and the concepts, contents, and focus they had chosen to achieve the learning outcomes. Even though the curriculum document created a guideline, only after moving towards the reproduction phase was the role of theoretical or practical knowledge discussed more profoundly and did the concepts of knowledge underpinning the curricula become real (cf. Young, 2008). As a result, the curriculum knowledge as a negotiated artefact in documents and as implemented in teaching had discrepancies, reflecting the HEIs knowledge practices, different qualification routes and differently specialised knowledge that form them.

Boundaries of curriculum knowledge in the field of reproduction

The data used in this study did not allow for examination of students' eventual attainment but teachers' conceptions and experiences, with an evaluative look at the qualities provided in the two HEIs. These are next reported by paying attention to the level of complexity of knowledge attained by the end of the undergraduate degree.

The weakening of the boundaries between HEIs curricula created misalignment in the curriculum knowledge, for example, by introducing students to knowledge that was not structured or paced accordingly. This may be problematic for those students who come from weaker educational and social backgrounds (Muller, 2015). In HASS, where students studied in mixed groups, they experienced a risk for deterioration of the level of complexity, which resulted in confusion:

> I think we cannot lower the 'level' of knowledge to make all students get it. [--] There is this problem, that some students do not get, but we lack the resources to explain in more detail to some and go faster with others. I can also imagine that our students do not have that kind of practical knowledge that is required in UAS-led courses, and they will have gaps too. (RIU-HASS-5)

In STEM, where teaching was not mixed, RIU teachers agreed that undergraduates from the UAS gained a deeper knowledge of the professional practice. The length of the studies, 3 years at the RIU and 4 years at the UAS, created a different basis for their attainment. The knowledge basis at the RIU was built on theoretical knowledge, and the relevance for working life appeared at a later phase. The difference in student attainment is captured clearly in the following:

> I can see the difference when those who graduate from UAS continue their studies at a RIU. If they are asked in an exam to draw a solution, students with a UAS background usually give much better answers compared to our own undergraduate students. However, if a basic case to calculate is not asked, but something different with conditions being changed or added, students with a UAS background might be puzzled because the formula that they are used to using does not work. (RIU-STEM-4)

This more analytical approach could be characterised as generic skills, but in this case, a strong connection to theoretical and conceptual knowledge is visible. An important notion

here, however, is that RIU students may reach this knowledge only at the master's level. These findings contrast with EQF expectations of a similar level of complexity at the undergraduate level, including practical skills that RIU students lack. Respectively, UAS graduates appeared to lack theory-based critical thinking and analytical skills to face unpredictable situations, as required by the EQF. This means that by the end of the same undergraduate level, the students of the two types of HEIs would not attain similar qualities.

This finding is aligned with a recent study in which almost 60% of undergraduate students in Finland achieved only a satisfactory level in generic skills (understood as analytical reasoning, argumentation, language, and problem-solving skills), and especially UAS students lacked these skills (Ursin et al. 2021). All these skills are highly related to the systematic knowledge and address the importance of approaching curriculum knowledge comprehensively.

The divide between different knowledge was strong, even though some teachers at both HEIs were more ready to weaken the boundaries and saw the potential in the shared degree in the future: 'Together, these schools could produce, I would say, super-courses, and students would learn hugely' (UAS-STEM-1). However, uniting the knowledge interests of both HEIs create a risk that curriculum is'bursting at the seams' (Muller, 2015). Another risk is that either the conceptual or contextual curriculum coherence is deteriorated. Attention is needed to the knowledge structures and curriculum coherence, to determine what could and should be eventually attained.

Discussion

This study explored knowledge in the shared undergraduate curricula of the two HEIs with distinct epistemic orientations: the legitimation of different forms of knowledge, boundaries, and differentiation. The disciplinary fields of the present study, engineering and tourism, both operate between the disciplinary field and field of practice, albeit with varying emphases at different HEIs.

The findings show that the HEIs have different foundations for knowledge. Decisions in education policy created two types of HEIs with different tasks given by legislation, followed by faculty recruited either based on scientific or professional merits, and the legitimation of a certain type of knowledge in their curricula. This creates the basis for strong classification between the HEIs and the systematic distinctiveness this study shows. According to Bernstein (2000), insulation is preserved with power and creates both internal and external order, as well as dilemmas and contradictions. If the principles of classification are reconsidered, it may pose a threat to integrity. This happened in cross-curricular initiatives, where the power relations between the groups were reconsidered and the former boundaries and identities were mixed. As a result, the boundaries weakened, but as the 'starting point for everything' was different, they ended up struggling for different forms of knowledge in curriculum making.

Bernstein (2000) states that pedagogic practices are an arena for the struggle over the nature of symbolic control, and the move from strong to weak may result in changes in organisational practices, pedagogical transmission practices, or the concepts of knowledge itself. Official curriculum knowledge was formulated here as learning outcomes but emerged as knowledge with symbolic boundaries and an invisible pedagogic order. The informants experienced pressure to change towards the knowledge practices of the other HEI. The current policy, where boundaries between HEIs of different types were weakened,

could be depicted as a push for the RIU towards 'profane' knowledge. Simultaneously, this situation creates space for academic drift for UAS when thinking of RIU status as a site of the highest knowledge. The results of this study show that this drift does not include profound capability or interest towards 'pure' knowledge, which is a fundamental feature of a RIU, but those coming from the RIU neither expressed interest or capability towards 'profane' knowledge practices. Thus, the autonomy of education, a fundamental feature of higher education, became visible either in shared teaching initiatives or in divided and thus invisible pedagogical practices (cf. Bernstein, 2000).

Decisions between similarity and disparity are needed when higher education institutions of different type create shared curricula. Instead of the naive and split use of EQF and learning outcomes, those responsible for quality assurance must avoid 'the convenience of one-size-fits-all simplifications' (Erikson & Erikson, 2019, p. 2301). When knowledge structures are based on distinctive logics, it is challenging to put them into the same framework without affecting the complexity and coherence of knowledge. Degrees in both HEIs may benefit from blurring knowledge traditions and creating new forms of knowledge practices, but the best qualities of each are at risk of disappearing. The question of whether the harmonised degrees with similar 3 + 2-year structures fit all disciplinary fields was already raised in the early phases of the Bologna Process (Heitmann, 2005; Winberg et al., 2016). This question is also valid from the perspective of curriculum knowledge. One may ask if it is epistemologically realistic or even desirable to strive for the same level of complexity in different types of HEIs and degrees with a distinct orientation to curriculum knowledge. This is important to discuss in educational policy in the case of plans to advance instructional rapprochement between HEIs of different type. Similarly, in HEIs that plan mixed degree programmes, it is crucial to include the knowledge perspective in their cross-curricular initiatives. This is because the internal relations (knowledge relations) and external relations (social relations between the HEIs) differ or match in tandem (cf. Bernstein, 2000).

Focus on a harmonised degree and emphasis on the sameness of competencies and learning outcomes obscure the question of knowledge. This 'knowledge-blindness' resulted in practices where the official discourse appears to have similar learning outcomes, which are not similar from the perspective of knowledge. If the rationale to weaken the boundaries is on the streamlined educational processes and their efficacy, there is a risk of gaps in knowledge. This risk is evident also in initiatives to create more flexible and rapid paths to leaning outcomes, for example through micromodules and digital badges. They are depicted as a new currency of educational power, as they challenge higher educational 'institutions privileging exclusivity of education, credentials, and evidence of learning' (Willis III et al. 2016, p. 24; see also Wheelahan & Moodie, 2021). The question of knowledge requires more research in these initiatives, as they reflect a trend to highly optimistic enterprises to have 'shortcuts' to knowledge.

The present study focused on exploring curriculum knowledge from the perspective of institutional boundaries. The results raise questions about the differences between the fields of STEM and HASS, with distinct knowledge structures, which requires a more in-depth analysis. A follow-up study from the disciplinary perspective is already under review. The present study shows a discrepancy between knowledge as recontextualised and reproduced, providing students with different access to different forms of knowledge. Fundamental decisions on knowledge occurred in the field of reproduction by the teachers involved in teaching. This implies that this stage should receive much more attention in curriculum reforms and require more scholarly attention.

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Declarations

Conflict of interest The author declares no competing interests.

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