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Responsive curriculum development for professional education: Different teams, different tales

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Abstract

Due to fast and unpredictable developments, professional education is challenged with being responsive, which demands a rethinking of conventional curriculum development approaches. Yet, literature on curriculum development falls short in terms of recognising how to react rapidly and adequately to these new developments. This study focuses on curriculum development initiatives at the school level in a Dutch university of applied sciences. Open interviews were held with 29 curriculum developers to explore how they define and give substance to developing curricula for new, changing or unpredictable professions. These 29 participants were involved in seven curriculum development trajectories. Four themes were detected: (1) curriculum developers are in favour of open, flexible and authentic curricula; (2) the context in which the curriculum development takes place and the different roles and responsibilities of curriculum developers are challenging; (3) curriculum developers feel insufficiently equipped to carry out their tasks; and (4) involving stakeholders is necessary but results in a "viscous" social–political process.

Responsive curriculum development requires a great deal of flexibility and adaptability from curriculum developers. Yet, in our study, "institutional concrete" is found to severely hinder responsive curriculum development processes. To be responsive, such processes need to be supported and institutional barriers need to be removed.

KEYWORDS
curriculum development, professional education, responsiveness

INTRODUCTION

Due to rapid demographic, economic and technological developments, professions change and sometimes even disappear, while new ones emerge at the edge of various professional domains (Palonen et al., 2014). Professional educational institutes are challenged with being responsive to the fast pace and unpredictability of these changes in order to adequately prepare young professionals for future work (Bude, 2000). In attempting to do so, professional educational institutes are challenged to change their curricula or develop new ones regularly or even continuously. Just a few examples of changes required in today's professional education are more emphasis on less linear curriculum paths, more attention paid to teaching powerful knowledge (i.e., being able to better explain and understand the world, think about alternative futures and how to influence them and follow and participate in current debates of local, national or global significance; Young, 2013, 2014a, 2014b) and enabling students to become flexible and lifelong learners (Fahey, 2012; Federighi, 2018). Yet, despite educational institutes acknowledging rapid developments in society and the subsequent demands to be responsive, they often fall short in terms of reacting rapidly and adequately (i.e., responsively) to new circumstances with regard to curriculum development (Snow-Andrade, 2018).

Curriculum development, generally defined as developing a "plan for learning" (Taba, 1962, p. 10), has always been one of the most complex tasks for educators. Thijs and Van den Akker (2009) describe the various levels at which curriculum development can take place. They distinguish the following levels: supra (international curriculum level), macro (national curriculum level), meso (at the school level), micro (at the group/teacher level) and nano (at the student level). In the Netherlands, where this study took place, the relationships between the macro, meso and micro levels are quite loose (Thijs & Van den Akker, 2009). The Dutch government is reluctant to adopt substantive regulations, and curriculum developers (in this study's context, mostly teachers[1] with a curriculum development role) have considerable freedom to develop curricula in higher education. However, these curriculum developers do have to take into account national agreements concerning content and learning activities at the sectoral level. In the Dutch context, development activities are usually influenced by a combination of designer preferences and organisational factors, such as curriculum characteristics, organisational rules, available resources (e.g., time, personnel and financial support), the other team members involved, team communication and cooperation with other stakeholders (McKenney et al., 2002).

As a consequence of this considerable freedom granted to curriculum developers, curriculum development is seen as a typical social–political process (i.e., all political and social

processes that are involved in curriculum development; Goodlad, 1994). In such a process, curriculum developers need to be competent social engineers, who have political awareness and the ability to deal with a constantly changing professional field, develop relationships, balance power relations and achieve consensus with diverse stakeholders (Letschert & Kessels, 2003). These social–political processes have already been given a place in Walker's (1970) deliberative approach to curriculum development, which we therefore adopt as the underlying theoretical framework of this study. Walker (1970, p. 1) asserts, in his model, that curriculum development mainly functions.

> to transform an initially vague, unsystematic, but strongly held vision of the educationally desirable into a concrete educational program. This transformation is accomplished first by attaining […] a body of shared beliefs about curriculum. Then, using this […], the project staff develops a plan of work.

In addition to social–political processes, Goodlad (1994) describes how curriculum development entails technical–professional processes (that is, designing, improving and implementing the actual "technical construction" of the curriculum). Technical–professional curriculum development processes proceed in a cyclical manner with the core activities of analysis, design, development, implementation and evaluation (ADDIE; Branson, 1978). Examples of the different activities performed during these steps are the following:

1. Analysis: performing problem, task, context and content analysis
2. Design: deciding on substantive parts or components of the curriculum, such as aims and objectives, subject matter, learning and instructional strategies, learner tests, timings and locations
3. Development: creating and revising curriculum prototypes
4. Implementation: applying the curriculum in practice
5. Evaluation: testing the quality of the prototypes or final deliverable.

All the ADDIE steps and various ADDIE cycles are needed to accomplish a strong new curriculum.

It is complex for curriculum developers to deal with these social–political and technical–professional processes that are always associated with curriculum development. Moreover, due to the accumulation of ongoing professional and societal changes that must be continuously included in curriculum development, the complexity only seems to have increased in recent years. Nieuwenhuis et al. (2021) state that the mutability of professions causes the need to change learning outcomes, which requires a great deal of flexibility from the curriculum and from curriculum developers, who will have to continuously monitor developments in the field. This ability of curriculum developers to respond quickly and adequately to changes in the profession is called *responsiveness*. We define responsive curriculum development as the ability of curriculum developers to translate knowledge about new developments into curriculum content and structure. Responsiveness is nowadays considered of great importance for educational development (Nieuwenhuis et al., 2021; Snow-Andrade, 2018).

At the same time, four particular emerging concerns are exerting increased pressure on curriculum development processes: (1) a time lag dilemma, (2) inflexibility in curriculum development approaches, (3) the lack of agency[2] and (4) the lack of support. Below, we will further explain these four issues.

The first concern encompasses what Voogt and Nieveen (2017) refer to as "the time lag dilemma". They argue that when new labour market needs are identified, changes in education are likely to lag behind the changes taking place in the real world. This time lag dilemma is a particular concern for vocational and professional education, where curriculum

developers often continuously revise curricula to meet trends in the industry, faculties, the student population and the economy (Dopson & Tas, 2004). Today's curriculum development seems to be situated at the interface between the traditional certainties of systematic development and the current uncertainties that arise from rapid changes in the professional field. Dealing with curriculum development and, in particular, with the discussion on the specific demands of a changing society and professional field, seems to require curriculum development activities that go far beyond a systematic approach following step-by-step procedures (Letschert & Kessels, 2003). Instead, Letschert and Kessels (2003) advocate an integrated systematic (based on step-by-step procedures) and social–political approach to curriculum development. For this integrated approach to succeed, curriculum developers need to be competent social engineers who skilfully manage the social venture of responsive curriculum development. However, whether curriculum developers succeed in doing so, and how they are giving substance to this complex process nowadays, remains rather unknown.

The second concern relates to the lack of flexibility in curriculum development approaches. Nieuwenhuis et al. (2021) state that, in the Netherlands, curriculum development is still often characterised by a linear approach (see Figure 1). In such an approach, national agreements concerning content and learning activities at the sectoral level are a starting point for curriculum development.

Nieuwenhuis et al. (2021) argue that two problems complicate a responsive approach to following this model step-by-step. First, this linear model leads to the logistical problem that "the labour market of the day after tomorrow will be served with knowledge from the day before yesterday" (p. 78). Second, in such linear models, the professional content is no longer a topic of discussion (since it is recorded in national agreements concerning content and learning activities at the sectoral level). As a result, the discussion between study programmes and the professional field mainly focuses on organisational aspects, such as the availability of practical apprenticeships and the planning of education in terms of its time and sequence. Until now, no models for responsive curriculum development have been available in the (international) literature. While more research is needed to develop a responsive curriculum development model, Nieuwenhuis et al. (2021) propose an initial "model" in which responsive curriculum development is performed more interactively. In this model, the design starts from "the outside" (the professional field) and moves "inwards" (see Figure 2). The interaction and co-makership between curriculum developers within regional professional fields during each phase of curriculum development forms the core of the model. Such an approach may offer the opportunity to respond to developments in the field, and the national agreements serve then as a frame of reference.

However, it is unknown whether curriculum developers are able to flexibly use the national agreements in order to responsively develop curricula. It has always been difficult for curriculum developers to follow curriculum development frameworks (Nieveen et al., 2010; Nieveen & Van der Hoeven, 2011; Pieters et al., 2019), and we expect that the required level of responsiveness further complicates this. Moreover, research informing suggestions concerning how curriculum developers define responsive curriculum development, and what

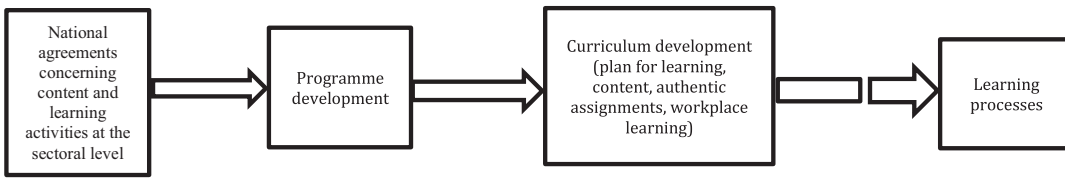

FIGURE 1 Linear model of curriculum development

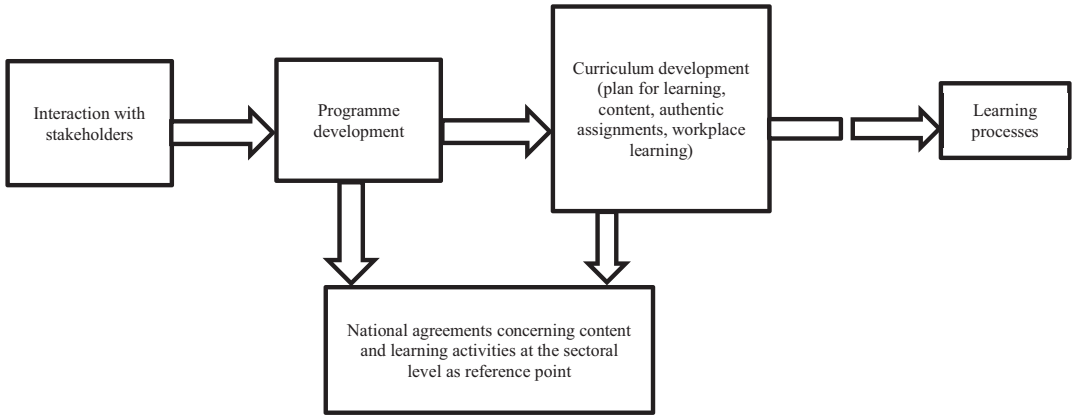

FIGURE 2 Interactive model of curriculum development

this process should entail from their point of view, is lacking (Snow-Andrade, 2018). These suggestions are important because curriculum developers at the school level are increasingly required to act as agents of the curriculum change, and their attitudes and beliefs regarding the initiated change influence the way they will act as change agents (Priestley et al., 2012).

Accordingly, our third concern relates to this lack of agency. Agency, defined as the capacity of actors to "critically shape their responses to problematic situations" (Priestley et al., 2012, p. 8), and which is important for the success of curriculum development processes, can be achieved under particular ecological conditions. However, Priestley et al. (2012) state that there is arguably a low capacity for agency in terms of curriculum development within modern educational systems. Even in the Netherlands, where curriculum developers expect to have a considerable amount of autonomy, they perceive the negative influence of prescriptive curriculum frameworks and a culture of accountability and performativity (caused by inspection regimes, for instance), which means that contemporary curriculum development is largely discussed in terms of frameworks, rules and examination regulations. It seems that this combination of having to incorporate changes at an increasing pace and the pressure to attain good results means that curriculum developers, who struggle to get to grips with curriculum development, do not dare to take risks, which, in turn, undermines their degree of agency (Harris & Graham, 2019).

The fourth concern regards the lack of (responsive) curriculum development support. Several studies have shown that when curriculum developers at the school level develop curricula themselves, they often lack design knowledge and need support when performing this task (e.g., Nieveen et al., 2010; Nieveen & Van der Hoeven, 2011; Pieters et al., 2019). They regularly use intuitive ways to perform curriculum development (McKenney et al., 2015), which frequently results in a lack of analysis and evaluation activities and a focus on exchanging ideas, rather than confronting them and developing new ones (Ehlen et al., 2016; Huizinga et al., 2019). However, Nieveen et al. (2010) report that, despite this knowledge of curriculum developers' needs, they often receive little support during the process. Huizinga et al. (2019) also indicate that no unambiguous support approach is available. Pieters et al. (2019), for example, discuss the need for, and examples of, diverse types of support (e.g., teacher involvement, professional learning communities, facilitators), but thus far, there is no convenient practical support for responsive curriculum development. This may be even more complicated because a common language for discussing responsive curriculum development (processes) is lacking (Nieuwenhuis et al., 2021) as little is known about specific sequences, criteria and interdependencies, which are essential elements of a

practical support approach (Kuiper et al., 2013). In addition, responsive curriculum development is characterised by a development process conducted by and with diverse stakeholders (Nieuwenhuis et al., 2021). These stakeholders are not obviously familiar with, or trained to technically develop, curricula and manage the associated social–political processes. However, it is unknown if, and if so, which, guidance might be needed both in schools and professional practice at all levels of the involved organisations (Leeman et al., 2020).

In summary, time-consuming and inflexible curriculum development approaches, the lack of agency and the absence of sufficient practical support do not seem to support curriculum developers in terms of being able to carry out the complex task of curriculum development. Despite the multitude of curriculum research studies in general, little attention has been paid to how curriculum development can be made more responsive, meaning how curriculum developers can adapt their approaches to the changing professional field in such a way that the curriculum development process is rapid and adequate. Moreover, existing insights into curriculum development do not seem to contribute to responsive curriculum development processes in professional education practice (Snow-Andrade, 2018). Yet, despite the absence of research-informed suggestions, many institutes attempt to be responsive, and we propose that experiences and insights have been acquired in the process of developing today's curricula by coping with the challenges curriculum developers are confronted with. We therefore investigate their current responsive curriculum development approaches. Specifically, this study explores how curriculum developers define (RQ1) and give substance to (RQ2) responsive curriculum development.

MATERIALS AND METHODS

Since we cannot rely on existing models or approaches for responsive curriculum development to steer the data collection, we opted for a qualitative approach to comprehend the curriculum development process in detail. For this study, we conducted open interviews to explore how curriculum developers define and give substance to responsive curriculum development.

Participants

This study took place at a university of applied science (UAS) in the Netherlands. The term UAS refers to “hogescholen” there. These institutions offer undergraduate tracks, professional bachelor's and master's degrees and postgraduate programmes for specific professions, similar to, for instance, (university) (professional) schools in the US, fachhochschulen in Germany and new universities in the UK (Huisman & Kaiser, 2001).

Curriculum developers in professional education in the Netherlands have a considerable amount of autonomy to develop curricula. Here, curricula are mostly developed by teams of teachers, sometimes extended to include other stakeholders (e.g., students, professionals from the associated professional field, clients, educationalists, managers). We aimed for a diversity of views on the curriculum development process by selecting different curriculum developers (e.g., teachers, professionals from the associated professional field, managers). Curriculum developers tenured at the UAS who were involved in curriculum development (a full programme) for new, changing or unpredictable professions were purposefully selected using snowball sampling (Goodman, 1961) and were invited to participate in this study (till saturation was reached). We also invited two curriculum developers from another UAS. Their teams consisted of at least three members and worked in close collaboration with their associated professional fields. Given our

explorative aim, we selected curriculum developers from various professional domains, namely healthcare, engineering, business and chemistry. They had different curriculum development experience, ranging from zero experience of full programmes to previously having developed two full programmes.

In total, 29 curriculum developers from seven different teams and four different domains were individually interviewed (11 women, 18 men). We selected the following: two professors, one researcher, two directors (from the professional field), two directors (UAS), seven teacher-team leaders (UAS), one project leader (teachers), three internship coordinators (teachers/professional field), six teachers participating in curriculum committees (UAS), two teachers (secondary vocational education), one teacher (UAS), one professional (from the associated professional field) and one student. When we use the term *curriculum developers*, we refer to this group. First, 10 individual interviews (from the 29 in total) were held with teachers participating in curriculum committees within different teams and domains (healthcare, engineering, and business). In these, several curriculum developers referred to the chemical engineering team as a unique example of responsive curriculum development. We will refer to this team as “Brisk”. We were curious about its approach and decided to investigate it in depth. So, second, we decided to include Brisk in our research and conducted 19 (from the 29 in total) more individual interviews there, after which we reached the point of saturation.

The context of brisk

In around 2004, managers and teachers from the chemical engineering team at the UAS founded a small lab at the university to be used for research purposes. Research assignments and funding for this lab were provided by regional companies. UAS students carried out the research supervised by their teachers. In 2007, the lab moved to a vacant lab space in a nearby chemical plant. As 2012 approached, an expansion took place. The chemical engineering team of the UAS, teachers from a vocational educational institution, a university offering academic programmes and several large companies jointly started a new company, which is referred to as Brisk in this study. Nowadays, a significant part of the bachelor's curriculum of chemical engineering of the UAS takes place at Brisk. The content of the Brisk programme is comprehensive and contains subjects such as biology, medical laboratory research, chemistry and chemical engineering. With this broad content, Brisk is responding to the need to blur the boundaries between professions. The first two years of the programme have a fixed core with various opportunities to choose courses that reflect undergraduates' own interests. The third and fourth years are left open. During these two years, undergraduates work on projects and attend electives. The final graduation project consists of an authentic assignment within a company (located at Brisk).

Reflexivity

Four researchers were involved in the data collection and analysis. All the researchers were insider-researchers with experience in both teaching and researching at the UAS where the research took place. Their various backgrounds allowed the exploration of different angles regarding the methods and for interpreting the results. Four writers were involved in the writing of this article. Three of the four authors were not involved in the data collection but did discuss the analysis and results afterwards. Two of the writers were not insider-researchers. Reflecting on this process, we explored our “knower's mirror”, preconceptions and beliefs (Malterud, 2001) and found a balance between our theoretical and qualitative ambitions.

Data collection

Instruments: Interview guideline

The interview guideline consisted of two open questions: (1) What does a responsive curriculum development process entail? (RQ1) and (2) How do you give substance to responsive curriculum development? (RQ2). The following are examples of the sub-questions used: What can you say about the volatility of your related professional field? Can you describe your own responses to changes in your related professional field? What does curriculum development entail for a changing professional field? What criteria should responsive development meet? What are limiting/enabling factors of such a development process? Can you describe your own perceptions regarding the responsiveness of your own curriculum development process?

Procedure

The principle researcher and four other (trained) co-researchers conducted the interviews. To refine the working method and to ensure the elicited responses were in accordance with the research questions, two co-researchers conducted the first three interviews and debriefed together. After the alignment of the intended working method, the other interviews were held by one interviewer. Each interview lasted approximately 60 min. With the consent of the curriculum developers, the interviews were audio recorded and transcribed verbatim. The curriculum developers received the transcripts and, later on, summaries based on the transcripts, and were invited to review and make additions to ensure internal validity (member checks) (Denzin & Lincoln, 2011; Miles & Huberman, 1994). We started the analysis concurrently with the data collection. After the first interviews, the two co-researchers discussed the principle themes that were mentioned in a particular interview and contrasted these with those identified in previous interviews. This iterative process allowed us to estimate the point of saturation. After saturation, we held one more interview to confirm this (Strauss & Corbin, 1998).

Data analysis

At first, the two (aforementioned) co-researchers iteratively read, identified and coded meaningful segments of the first six transcripts individually and independently. Meaningful segments can be defined as short fragments of text (Strauss, 1987). In this study, each meaningful segment contained 100–300 words. The segments were selected based on the research questions. Both researchers discussed, specified and revised the meaningful segments until consensus was reached. Then, the segments were coded. For the purpose of coding, a coding frame was developed. This was grounded in the data rather than decided a priori. Open coding was performed line-by-line, which is a precise form of coding (Strauss & Corbin, 1998). Both co-researchers reviewed the emerging coding frame and refined the codes through a process of constant comparison and axial coding (Strauss & Corbin, 1998). The emerging codes were compared, and any discrepancies were resolved by consensus. Thereafter, the principle researcher coded the remaining transcripts.

Finally, both researchers deductively coded another randomly selected 10% of the interviews individually and independently, following the suggestion of Miles and Huberman (1994), to enhance the reliability of the coding process. During this process, both researchers

identified a total of 592 segments, of which 304 (51%) were identical, meaning the same text was selected and the same code was allocated (*Kappa* = 0.61). After consensus discussions regarding the code definitions, the 592 segments identified were recoded. Now, a sufficient number of 469 segments (79%) were found to be identical. Then, the segments were coded. This process yielded 110 codes. Thereafter, the principle researcher merged similar codes, removed duplications and sorted the codes and references based on literature (content sampling) and consensus discussions between the two researchers (Miles & Huberman, 1994). Codes that did not match the research questions or contained a small number of references were reconsidered and sometimes merged, assigned as subcodes or eliminated. This process yielded 26 main codes that can be divided into 4 main themes. This process resulted in substantial intercoder reliability (*Kappa* = 0.80).

The coding process was tracked in a codebook and memos. Codes were selected to illustrate the themes raised by the curriculum developers and to choose examples that were indicative of both typical responses and the diversity of the views obtained (Strauss & Corbin, 1998). The identified themes were considered in relation to relevant literature (for a part of the coding framework, see Table 1).

RESULTS

The following paragraphs summarise how the curriculum developers (*N* = 10) defined a responsive curriculum (RQ1) and how they gave substance to responsive curriculum development (RQ2). We categorised and summarised the findings into four related themes: (1) an open, flexible and authentic curriculum, (2) the challenging context, roles and responsibilities of curriculum developers at the school level, (3) stakeholder involvement and (4) facilitation. The first theme corresponds to the first research question, and the other three themes relate to the second research question. By presenting the numbers of participants ("*N*"), we have made visible how many curriculum developers agreed with our statements. Brisk curriculum developers (*N* = 19) held distinct views on these themes in comparison with the other curriculum developers (*N* = 10), and we will therefore address their views in a separate paragraph per theme.

Theme 1: An open, flexible and authentic curriculum

Curriculum developers (*N* = 9) considered the openness, flexibility and authenticity of the curriculum to be important characteristics of a responsive curriculum. In their view, a responsive curriculum is a kind of (partially) open curriculum, with the form of a "curriculum vitae", rather than a finite (four-year) programme.

> Don't design a rigidly specified curriculum, but leave some room for current events and new topics you would like to address. [P1; teacher participating in curriculum committee in healthcare domain]

> They will partly use simulated authentic learning activities and descriptions of more case studies, but for the most part, as it stands now, the idea is to do real exercises. [P2; project leader in healthcare domain]

> I would like to begin by pointing out that the *teaching* should be responsive, not *the curriculum*.

TABLE 1 Coding framework

Open coding nodes	Axial coding nodes	Themes	Literature
Defining a responsive curriculum (RQ1)			
Curriculum as a curriculum vitae			
Futureproof	Responsive curriculum (product)	**An open, flexible and authentic curriculum**	Goodlad (1994)
Flexible			
Open			
Modular			
Minor			
Room for change	Frameworks, rules & regulations		
Solid core			
Elective			
Authentic			De Vries (2016)
Authentic situations, authentic assignments			Akkerman and Bakker (2011)
Living labs			
Boundary crossing/hybrid learning			
(National) frameworks/ rules/regulations/ visitations			
Responsive curriculum development process (RQ2)	Responsiveness (process)		Goodlad (1994)
Complex process			
Innovation	Social–political	**Complex technical–professional process**	
Organisation			
Politics (political game)			
Motivation			
Culture	Quality curriculum developers	**Dealing with conflicting contexts (social–political process)**	
Serendipity			
Changing (role) professional practice			
Leadership			
Interests (conflicting)	Roles & responsibilities	**Curriculum developers at the school level**	
Conflicts			
Making choices			

(Continues)

TABLE 1 (Continued)

Open coding nodes	Axial coding nodes	Themes	Literature
Quality curriculum developers at the school level		**Dealing with different roles and responsibilities**	
Professionalisation			
Autonomy (curriculum developers)			
Pressure			
Urgency			Tuomi-Gröhn & Engeström (2003)
Roles and responsibilities			Hargreaves (2001)
Ownership			Dodd & Ganster (1996)
Responsive curriculum development process (RQ2)			
Finance	Facilitation support	**Facilitation**	
Subsidy/funding/funders			
Manageability			
Resources		**Finding the most suitable support is challenging**	
Support (by leader)			
Lack of facilitation/lack of support			
Appreciation/confirmation			Huizinga et al. (2019)
Privileges			Kuiper et al. (2013)
Responsive curriculum development process (RQ2)			
Initiating stakeholder involvement	Stakeholder involvement		
Ownership			
Maintaining stakeholder involvement			
Co-construction/ cooperation with stakeholders			
Teamwork/cooperation team			
Team characteristics		**Challenging process Stakeholder involvement**	Pietarinen et al. (2017)
Team learning			Van Schaik et al. (2017)
Team responsibility			Lawson (2004)

> The term *curriculum* is already part of the discussion … a curriculum translated into or defined as a programme developed in four years that a cohort has to follow, well, that wouldn't really be responsive in my eyes. [P3; teacher, team leader in engineering domain]

Even though they were striving for a responsive curriculum, they also seemed to desire a more static one in terms of a product that could be completed.

> I do hope that it [the curriculum] will last a little longer than 4, 5 years. [P4; teacher participating in curriculum committee in business domain]

Despite giving a definition of a responsive curriculum, curriculum developers argued that their curricula did not adhere to their definition. They reported that everyone's subject needed to have a place, resulting in overloaded curricula and gaps between theory and practice.

> Choices we have made already take up a lot of space. And there will always be people who say this and that should be included; we don't want that, but we end up making choices anyway. We want to be thorough about it, and we want to do a lot. It comes at the expense of the extra room you would also like to leave in the curriculum. Over the years, we build different levels in terms of learning outcomes (…) [The participant describes a vertically integrated curriculum]. [P1; teacher participating in curriculum committee in healthcare domain]

Brisk

Brisk curriculum developers also characterised their curriculum on the basis of its openness, flexibility and authenticity. They did not discuss a prepossessed curriculum plan or blueprint; ever-changing authentic professional projects formed the basis of their curriculum. These projects were not seen as the *content* of the curriculum, but they *were* their curriculum. Brisk curriculum developers mentioned that "communities" were introduced as a concept, indicating the realistic, project-based collaboration of students, teachers, researchers and chemists. Consequently, Brisk curriculum developers did not report gaps between theory and practice, nor overloaded curricula.

> We call it a community for development: it's three students, and it includes an experienced lab technician, and there's a coach, usually someone in our field with a commercial background in a specific subfield. [P23; teacher, internship coordinator]

In sum, the theme described above shows that curriculum developers characterise a responsive curriculum as open, flexible and authentic. However, differences existed in the extent to which curriculum developers were able to adhere to their definition. Most curriculum developers argued that discussions about curriculum content were often avoided. They tried to include everyone's subjects to harmonise differences instead of integrating them, which resulted in overloaded curricula. In contrast, Brisk developers seem to have been better able to develop such a curriculum by allocating space to discussions in communities.

Theme 2: The challenging context, roles and responsibilities of curriculum developers at the school level

Curriculum developers mentioned that the curriculum development process was a complex and time-consuming task ($N = 9$). They indicated that qualification frameworks and classifications, (institutional) rules and regulations, exam regulations and examination boards were particularly restrictive in pursuing a responsive curriculum development process ($N = 7$).

> Things are very much controlled by [e.g., curriculum/institutional/professional] frameworks. There are so many requirements. [P2; project leader in healthcare domain]

> Our integrated assessment seriously stretched the limits of our Teaching and Examination Regulations, and we were lucky that they tried to accommodate us. But they didn't always say yes, by the way, so we also had to compromise at times. Those kinds of structures do make it very difficult to stay future-oriented. [P21; teacher, team leader in engineering domain]

Most of the participating curriculum developers had a teaching role. They argued that their role was changing ($N = 10$). They expressed how they were urged to be increasingly and continuously aware of developments in the professional field in order to make curricular choices.

> Teachers' role is changing. All teachers fear whether they are still “up to the mark”… [P3; teacher, team leader in engineering domain]

> It's extremely important that the professional has access to the market, where they can find the knowledge or resources they need. [P20; teacher in business domain]

They stressed that they were expected to be experts in content, pedagogy, coaching and curriculum development ($N = 10$). However, they did not feel like experts in all these areas. They experienced, for instance, limited design expertise ($N = 8$). Therefore, curriculum developers ($N = 9$) indicated that they needed enthusiastic teams with perseverance during the curriculum development process. They stressed that, at certain stages of curriculum development, different specific expertise might be needed.

> They should consist of very different perspectives. They should really be a mix. In successful teams, everyone comes from a completely different context. [P13; teacher participating in curriculum committee in healthcare domain]

Although curriculum developers realised the importance of composing teams in such a way that the expertise required is present at the right time, they reported that they barely succeeded in doing this.

Brisk

Brisk also described the responsive curriculum development process as complex and time-consuming. However, in contrast to the other curriculum developers, frameworks and classifications did not seem to hinder them. Brisk did not only assign the curriculum development role to teachers but additionally invested in a sort of “case developer” (internship coordinator),

who actually designed/determined the curriculum content. These case developers directed the connection between in-school and out-of-school learning by bringing in, and assigning, real professional projects for students. Therefore, they had to be continuously aware of developments in professional practice in order to make choices regarding specific curriculum content. They also had to effectively maintain contact with the universities and companies involved. Brisk curriculum developers also mentioned that teaching roles, and sometimes also the roles of professionals from the work field, were changing. They were not always content experts when dealing with their projects, yet they all carried these tasks out and learned from them.

> We shouldn't look at the rules, but at the values that inform those rules! It probably has something to do with the culture: look for the answer until you find it, every which way, and try it again … That's when "more trying" began to gain the upper hand over "mastering skills". [P5; director]

> The role of a teacher is changing. I literally told teachers: "You're not here because of your expertise; you're also just here to learn, you're also just a participant." [P10; professor]

> He had to really step out of his comfort zone and let go of the way he had always taught his course. [P11; researcher]

In sum, this theme shows that a responsive curriculum development process is complex and time-consuming. Many factors influence whether or not curricula can be developed responsively (e.g., examination boards, exam regulations, institutional regulations). Teachers, who were usually responsible for curriculum development, felt overloaded and insufficiently competent with regard to all their roles and tasks. They argued the need for a development team wherein participants are complementary in terms of expertise (i.e., substantive/didactic). At Brisk, they experienced the same struggle; however, Brisk curriculum developers perceived this as a learning opportunity, rather than something that demotivated them.

Theme 3: Facilitation

Curriculum developers indicated facilitation as one of the most important preconditions of responsive educational development. However, during curriculum development, almost all the curriculum developers experienced a lack of facilitation (e.g., financial facilitation, technical support, staff and time) ($N = 8$).

> The IT support on how to design that, to be very honest, was pretty much nonexistent. We did try to get training in that, but we didn't really have enough time for it, because we also had a lot of other things to do, and the whole process of becoming a team was very difficult, too. [P20; team leader (teacher) in business domain]

Curricula were almost simultaneously designed, developed and implemented, in addition to the execution of the curriculum or modules already in force ($N = 6$), which put pressure on several teacher roles (e.g., curriculum development, preparing lesson plans and educating students, quality assurance). Some participants ($N = 6$) even reported experiencing a certain "development-tiredness" before the process was completed.

> It's been very difficult this year because we were going to implement and partly develop the new curriculum. On top of that, we are still working with the old curriculum, which involves a lot of assessments with a lot of resits. Those are all problems this redesign also solved. It caused a lot of pressure, and we also had an accreditation assessment this year and a renovation [of buildings]. [P21; team leader (teacher) in engineering domain]

> If you ask me, “Are teachers tired right now?” then yes. Yes, they're all very tired at the moment. [P21; team leader (teacher UAS) in engineering domain]

Brisk

Brisk curriculum developers extensively described uncertainties regarding financial facilitation too, but they explained how they somehow managed to find a way to deal with these. They often described a certain serendipity.

> At first, the facilities were not paid for. I literally had to take discarded desks from the dumpster. [P5; director]

> Yeah, it's a little less controllable than we always hope it will be. It's often a bit of luck or the right thing at the right time. [P29; director]

They seemed capable of continuously organising opportunities instead of perceiving the lack of facilitation as an obstacle (e.g., they searched and applied for funding). Brisk curriculum developers even mentioned that a lack of facilitation enlarged their perseverance, creativity and motivation.

> I can't begin to tell you how creative we have been. [P27; teacher, team leader]

Brisk curriculum developers mentioned funding and a group of persistent, intrinsically motivated people, acting as the vanguard and organisers, driven by innovation, autonomy and their capacity for self-management and self-organisation, as crucial factors for their accomplishments.

> I have a strong feeling that you really need a group of confidants like that. It's not always easy being in the vanguard, and there are people, a wild bunch, who support you and who you can count on when you're having a hard time. [P5; director]

In sum, the theme described above shows that the facilitation of curriculum development was often experienced as inadequate, also at Brisk. Given this lack of facilitation, most curriculum developers felt demotivated, while at Brisk this led to a higher degree of motivation and creativity.

Theme 4: Stakeholder involvement

Almost all the curriculum developers mentioned the importance of various, internal and external, stakeholder interactions during curriculum development (N = 9). They stated that internal stakeholders (e.g., teachers, curriculum development experts/educationalists,

content experts) were often responsible for curriculum development. Curriculum developers described how external stakeholders (e.g., work field professionals, content experts, clients, students) played a particularly important role when exploring, selecting and describing authentic professional tasks. They stressed a preference that internal and external stakeholders should both have equal ownership in the process of curriculum development. However, they also mentioned that external stakeholders were often only consulted after (parts of) their curricula had been developed ($N = 5$).

> We made really good progress with that. We started with development groups in which all parties played a role, and we really kept that up for quite some time. We chose key professional situations as a starting point that formed the basis for the elaboration of the modules. Patients and students, for example, played a very important role in these decisions, but at a certain point, there was so much pressure to deliver and, well, knowing how important it is to involve those parties, it also slows down the process … And at some point, it all goes faster if you're working with a team of teachers. So, yes, that's when it was done at the expense of involving external stakeholders. [P1; teacher participating in curriculum committee in healthcare domain]

Students were hardly involved in the curriculum development process ($N = 1$). Moreover, some curriculum developers experienced severe difficulties in initiating and maintaining stakeholder involvement ($N = 5$) and in deciding which stakeholders to involve and when, as well as knowing what could be expected of them ($N = 5$).

> But what exactly will you ask them …? It's really very difficult. How should you actually do that? So, I use the way it is described in theory, but I also very much wonder: "How do you actually do that in practice?" [P2; project leader in healthcare domain]

No strategy for selecting stakeholders was mentioned in any of the interviews. Sometimes, it was even acknowledged how the choice of (external) stakeholders was based on chance encounters. When no external stakeholders were involved, curriculum developers experienced an absence of commitment or a sense of support. A lack of available time and a shortage of the aforementioned content expertise (both in the professional field and universities) appeared to be major barriers to initiating and maintaining stakeholder involvement.

Brisk

Brisk curriculum developers described similar difficulties, such as initiating and maintaining stakeholder involvement. In particular, they reported that it was hard to bridge organisational differences between educational and business organisations, but they found a way to do this.

> There are no problems related to backgrounds or … everyone knows that we are dealing with many different collective labour agreements. We put everything together, give it a shake. We have a few rules that work fine for us here, which we can use to design our business operations. Person A has sixty days leave, and person B has this many days leave. It's just the way it is. [P27; teacher, team leader]

They created communities as vehicles to bridge the differences. In this way, stakeholders were always involved in the entire curriculum development process, and all of them

had equal responsibilities in terms of achieving results. According to these curriculum developers, stakeholder involvement was successful because of their proximity to professional practice (courses were developed at the boundary between the UAS and the chemical company). Because of this, communities were well embedded in their work environments, including the UAS and other companies. Brisk curriculum developers cherished this "unique" concept.

> We are unique, I think, in the Netherlands. We're located in a business park and teach there. We're on this huge campus, very close to the companies. We often use the facilities of those companies. The university is there, our colleagues. We work closely together with them, and of course, we help each other when we can. There are advantages to being so close to each other. [P8; teacher, internship coordinator]

In sum, the "stakeholder involvement" theme shows that curriculum developers considered such involvement to be important in a responsive curriculum development process. In practice, however, it was not always easy to keep stakeholders involved throughout the entire process. In most cases, there was only a limited degree of, mostly internal, stakeholder involvement. Brisk took a different approach. Its "community approach" ensured that it succeeded in involving various stakeholders in the entire curriculum development process and when delivering the curriculum.

To conclude, the results reported above show that curriculum developers described responsive curricula as open, flexible and authentic. The development process was complex and time-consuming and was often carried out at the school level by curriculum developers with several teaching roles. These curriculum developers often felt overwhelmed by their various duties and insufficiently competent to carry out the curriculum development process. Furthermore, their intention to involve stakeholders throughout the entire process from curriculum analysis to evaluation did not always work in practice. As a result, their approaches mostly lacked a thorough analysis (and implementation) phase.

Most teams used a linear approach for curriculum development. Only Brisk seemed to use the (interactive) responsive curriculum development model as proposed by Nieuwenhuis et al. (2021). As such, the team at Brisk seemed to be better able to fulfil its intentions and is, both internally and externally, viewed as a promising example of responsive curriculum development.

DISCUSSION

This study explored how curriculum developers defined and gave substance to responsive curriculum development. Interviews were held with 29 curriculum developers to delve into their practical knowledge about the process of developing today's curricula. Our findings will be further discussed in relation to each research question.

Research question 1: How did curriculum developers define a responsive curriculum?

A responsive curriculum is open, flexible and authentic

The curriculum developers interviewed defined responsive curricula as authentic, up to date and (partially) open, consisting of modules that are easily replaceable and ideally situated at the level of professional practice (at its boundary with a university). For example, the Brisk

curriculum developers mentioned how they implemented communities where learning was centred around authentic tasks. These communities consisted of students, professionals and teachers. In such communities, the learning and working environments were interconnected and highly interdependent, which aligns with notions of a hybrid learning environment (Akkerman & Bakker, 2011).

Furthermore, curriculum developers' notions of a responsive curriculum as open and flexible align with De Vries' (2016) notion that a responsive curriculum requires a so-called permeability. A permeable curriculum has a strong core: the identity or "spinal cord" of the curriculum. Besides this, the curriculum offers free space and can be constantly adapted on a more ad hoc basis in terms of ongoing developments. In this regard, new topics can be temporarily included in the curriculum or eventually become a part of its core.

Research question 2: How did curriculum developers give substance to responsive curriculum development?

Four challenges complicated the responsive curriculum development process

Curriculum developers encountered four challenges that complicated responsive curriculum development processes: (1) dealing with conflicting contexts, (2) dealing with roles and responsibilities, (3) finding the best suitable support and (4) initiating and maintaining stakeholder involvement.

Challenge 1: Dealing with conflicting contexts

The first challenge involved dealing with conflicts between two contexts: (1) (the rapid changes in) the professional field they are educating for and (2) the institutional context of their own university. Curriculum developers attempted to incorporate rapid professional changes into their curricula, while they were simultaneously hindered by institutional conditions. These conditions (e.g., examination regulations) were often perceived as being "cast in concrete". Curriculum developers often experienced a university context that caused delays and prevented rapid curriculum development. In their institutional context, the search for certainty prevailed. This ultimately influenced curriculum developers, who tried to avoid uncertainty and, in the end, developed fixed and static curricula. These "rock-solid" conditions were not conducive to the responsiveness needed and required further exploration regarding how to deal with them. Harris and Graham (2019) describe a similar finding. They identify present-day curriculum development as a process in which curriculum developers seem to struggle with a culture of accountability and performativity, meaning that contemporary curriculum development is largely discussed in terms of frameworks, rules and examination regulations.

Harris and Graham (2019) further note that the educational value of the (changing) subject matter goes undiscussed. In the end, such struggles seemed to hinder curriculum developers' agency in decision-making, which, in turn, impeded the success rate of (responsive) curriculum development.

Brisk curriculum developers appeared to face the challenge of dealing with their context in rather a different way than other curriculum developers did. They were able to develop their curriculum responsively, despite facing similar obstacles in the institutional context. It is likely that the urgency for innovation played an important role in their success, and this can be underpinned by various theories. For instance, Tuomi-Gröhn and Engeström (2003) argue that, if the urge for change is considerable, people are able to step outside the box of existing frameworks. Brisk curriculum developers struggled with Brisk's right to exist. This

urgency was so dire and fundamental that it was able to lead to successful innovation. In sum, curriculum developers needed to sense sufficient urgency to foster persistence when dealing with contextual factors in the complex process of responsive curriculum development.

Challenge 2: Dealing with roles and responsibilities

The curriculum developers interviewed mentioned that they felt "overwhelmed" by their roles and responsibilities. Curriculum development was often executed by developers who simultaneously performed teaching roles, such as coaching, assessments, lecturing and quality assurance. Moreover, they seldom received training, resulting in them applying intuitive approaches to curriculum development. The combination of a lack of curriculum development expertise and having to perform different roles and responsibilities simultaneously weighed heavily on their shoulders.

This problem is also reflected by Hargreaves (2001) who argues that "the sheer cumulative impact of the multiple, complex, innovations on teachers' time, energy, motivation, opportunities to reflect, and their very capacity to cope" (p. 6) is problematic. At the same time, our findings indicate that having different roles and responsibilities combined with autonomy—as observed at Brisk—can possibly be seen as one of the success factors for responsive curriculum development. Dodd and Ganster (1996) found the same discrepancy in their data and reported that a wide range of roles and responsibilities combined with sufficient autonomy have a positive impact on job performance. In sum, sufficient expertise and autonomy appeared to be crucial for curriculum developers in terms of handling their different roles and responsibilities.

Challenge 3: Finding the most suitable support

The third challenge refers to the need for suitable support. Curriculum developers often mentioned that they required support to compensate for their own limited curriculum design expertise, and that they referred to guidance from curriculum frameworks, leaders and experts to prevent and to overcome design challenges. The role of curriculum developers at the school level, their capabilities and the demanding task of curriculum development (in terms of time and energy) creates the question of whether these curriculum developers need to be experts in all teaching roles or whether a design team should have experts available, as various scholars propose (e.g., Huizinga et al., 2019).

Huizinga et al. (2019) reported that curriculum developers need support regarding curriculum design expertise and innovation skills. However, Kuiper et al. (2013) warned against exceedingly prescriptive guidance, as it may unintentionally be perceived as decreased autonomy. Instead, these authors suggest that prototypical examples of how to develop a curriculum responsively may prove a better alternative. Based on our findings, we suggest that curriculum developers need to be supported in translating these examples into their own contexts and that help should be provided in such a way that it respects curriculum developers' autonomy.

Challenge 4: Initiating and maintaining stakeholder involvement

As a fourth challenge, curriculum developers stressed that they found it necessary, but difficult, to initiate and maintain stakeholder involvement. The stakeholders involved appeared to be a rather heterogenic group. Internal stakeholders (e.g., teachers, curriculum development experts/educationalists, content experts) were largely responsible for curriculum development. External stakeholders (e.g., work field and content experts, clients, students) were often only consulted after (parts of) the curriculum had been developed. Curriculum developers perceived that both internal and external stakeholders should have equal ownership and responsibilities regarding curriculum development and delivering a curriculum, as observed at Brisk.

However, when involving various stakeholders, curriculum developers experienced pressure to include everyone's proposals, resulting in a social–political process in which

curriculum developers often negotiated with external stakeholders rather than working together with them. Curriculum developers mentioned that they tended to avoid conflicts (as many teacher teams do; see Koeslag-Kreunen, 2018), with substantial consequences for their curricula. They incorporated new content but did not remove any existing curriculum content, resulting in "stuffed" and overloaded curricula.

These observations are in accordance with Pietarinen et al. (2017) and Van Schaik et al. (2017). Their findings point at the importance of the long-lasting involvement of various stakeholders throughout the entire curriculum development process (e.g., co-creation). The development process benefits from different stakeholders' insights, as it supports elaboration based on various kinds of expertise concerning curriculum design and professional and contextual knowledge (O'Neill & McMahon, 2012). Since stakeholder involvement is time-consuming, Voogt and Nieveen (2017) argue that the process may be more efficient when the development and implementation of the curriculum become more intertwined.

Similar to the first challenge, urgency also plays an important role here. Stakeholders need to feel the urge to participate and to benefit (equally) from such participation (Lawson, 2004). Not knowing how to involve stakeholders and keep them involved during the entire curriculum development process, combined with low levels of experienced urgency, were the factors that likely caused the lack of stakeholder presence, except at Brisk. Brisk curriculum developers reported the urge to collaborate with various stakeholders, and all the stakeholders benefitted from participating. External stakeholders were no longer seen as "external", but rather as equal contributors to the curriculum, since they performed important roles in developing and delivering it. Such an approach was beneficial to the achievement of a responsive curriculum development process.

In conclusion, due to rapid demographic, economic and technological developments, professional educational institutes are challenged with being responsive and with adequately preparing students for their future work. This study offers new empirical insights into how curriculum developers give substance to responsive curriculum development processes.

The premise of this study was to focus on both the technical–professional and social–political phenomena of curriculum development; however, the findings mainly reveal the political arena in which curriculum development actually takes place. There is an interplay between the following factors: the (social–political) context, skills, stakeholders, autonomy and urgency. All the curriculum developers described an—often-bureaucratic—institutional context in which "everyone" (e.g., fellow curriculum developers, teachers, examination committees, accreditation boards, related professional practices) needs to be involved.

The necessity of dealing with various social–political phenomena during a responsive curriculum development process requires a great deal of flexibility and adaptability from curriculum developers. Yet, the institutional concrete of the curriculum as a technical construction is not conducive to the flexibility and adaptability needed today. Also, the desired open, permeable character of curricula, which makes them responsive to changes, entails many uncertainties.

Our findings support the earlier introduced responsive curriculum development model by Nieuwenhuis et al. (2021) (see Figure 2). As the model suggested, responsive curriculum development appears to be interactive, which requires a frequent involvement of stakeholders during the different curriculum development phases. Moreover, our findings provide two suggestions to further refine the model. First, a responsive curriculum development approach is far more fluid than the model reflects. Our data suggest that responsive curriculum development appears to be a continuous process. This allows to include loops into the model and two-way arrows to emphasize the reciprocal nature of responsive curriculum development throughout the various curriculum development phases. Second, the model does not represent the different (f)actors curriculum developers need to deal with. Our data point at the significance of dealing with various social–political (f)actors during the entire development process, such as dealing

with different roles, responsibilities and frameworks, or the involvement of various stakeholders. Therefore, we argue to include such (f)actors more prominent in the model.

Compared to the curriculum development approaches of all curriculum developers involved in our study, Brisk demonstrated an approach that most closely resembles the model. On the one hand, a matter of urgency encouraged them to take steps that other teams may not dare to take by, for instance, literally placing education within professional practice, which opened up new avenues for educating their students. On the other hand, the nature of their goals and purposes (e.g., as stated in national agreements concerning content and learning activities at the sectoral level) and the nature of the institution shaped the curriculum and their curriculum development approach. Brisk practises what it preaches by offering what appears to be a more responsive model: it educates students to be innovators, shaped by its innovative curriculum development approach, which results in an open, flexible and authentic curriculum in which there is sufficient room for continuous innovation. However, it should be noted that, at the start, Brisk curriculum developers had no idea how to design their curriculum or how to cope with the various challenges either. They learned by doing and were able to break through the institutional concrete. This context may not be directly transferable to other contexts; however, Brisk has managed to make clever use of its context, albeit with—as they describe it themselves—a degree of serendipity. It provides, in that sense, an example for other study programmes.

However, in order to use Brisk as a sound example of responsive curriculum development, the process should actually be "back-engineered" through a longitudinal study that explores all stages of the curriculum development in depth. Important building blocks for this "back-engineering" are uncovered in this study and offer sufficient starting points for further investigation. In addition, there is a need to increase curriculum developers' expertise in terms of achieving responsiveness to better prepare them for the four aforementioned challenges. How to do so remains unclear from our data. Further research could focus on what support is essential, both in terms of processes and products, for creating design guidelines to provide more certainty in advance with regard to how to establish a responsive curriculum development process.

In sum, our study provided unique insights into how two different worlds of curriculum development practices have given substance to responsive curriculum development. Whereas the first "world" of curriculum developers did not seem to be able to handle the various challenges that complicate such a process, the other "world", Brisk curriculum developers, approached such challenges as opportunities. Despite their struggles and the social politics accompanying curriculum development, findings from Brisk offer exciting insights into how responsive curriculum development may be achieved successfully. In our opinion, building on these insights may move professional education a step further towards becoming more responsive to the complex and dynamic changes taking place in society.

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CONFLICTS OF INTEREST

The authors declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

ETHICS STATEMENT

This study was approved by the Open Universiteit ethical committee (Ceto): U/2020/01656/MQF.

DATA AVAILABILITY STATEMENT

Underlying data: The sensitive nature of these data means that they are only available internally to the research team for the purpose of this research. Interested parties are advised to contact the corresponding author (joyce.vreuls@zuyd.nl).

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ENDNOTES

[1] (University) teachers are defined as professional educators who work at higher education institutions and educate undergraduates, graduates or postgraduates for a specific profession (Houle et al., 1987). Their main focus is on teaching for professional practice and on advancing the knowledge and practice of professions through practice-based research and development (Houle et al., 1987).

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SUPPORTING INFORMATION

Additional supporting information may be found in the online version of the article at the publisher's website.

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