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Supporting medical teachers' learning : redesigning a program using characteristics of effective instructional development

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Chapter 3

Using teacher educators' practical knowledge
to select characteristics
of effective instructional development

3. Using teacher educators' practical knowledge to select characteristics of effective instructional development³

Characteristics of effective instructional development have been identified in the literature. Incorporating those characteristics in the design of instructional development can have a positive impact on the quality of this development. The aim of the study described in this chapter was to determine which of these characteristics, according to teacher educators, are most relevant for the design of actual instructional development in medical schools. This was done by using teacher educators' practical knowledge: we asked them to identify characteristics and describe effective instructional development programs in their own medical school. Interviews were conducted with teacher educators involved in instructional development in all eight medical schools in the Netherlands. First, they were asked to list which of the 35 effectiveness characteristics identified earlier they considered most relevant. Second, they were asked to describe effective instructional development programs, so that they could explicate practical knowledge that was relevant in their work context and we could derive additional characteristics from their descriptions.

A total of fifteen characteristics were identified: nine characteristics from the list of features that were rated most relevant by the teacher educators, and six additional characteristics that we identified from the interviews about effective instructional development. Examples of the characteristics selected are: providing systematic and constructive feedback, improving pedagogical knowledge, and reserving sufficient time for instructional development.

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3.1 INTRODUCTION

Instructional development is a relatively young domain in educational research (Sparks & Loucks-Horsley, 1989). In the early 1970s it started from a growing concern about the effectiveness of in-service instructional development. Nearly all research showed unanimous dissatisfaction with the in-service programs for instructional development, but at the same time there was a strong consensus that it was important. Instructional development came of age in the 1980s (Sparks & Loucks-Horsley, 1990), but has been changing again since then. Sparks and Hirsh (1997) describe various “shifts” that took place in this domain: (a) from individual development to a combination of individual and organizational development, (b) from a fragmented plan to a clearer, more coherent strategic plan, (c) from a focus on teachers’ needs and satisfaction to a focus on student needs and learning outcomes, (d) from training conducted away from the job to multiple forms of job-embedded training, (e) from a focus on generic instructional skills to a combination of generic and content-specific skills, (f) from teacher educators who function as trainers to developers who provide consultation, planning, and facilitation as well as training, and (g) from instructional development as a “frill” to instructional development as an indispensable process.

These changes, detected in general education, are also visible in medical education. McLean, Cilliers and Van Wijk (2008) divided the progress of instructional development in medical education into four decades. In the 1970s instructional development programs were set up as teacher education in which student ratings and written feedback were important. In the 1980s cognitive theories were the driving force in medical education, and teachers were expected to be process as well as content experts. Programs were set up as skills training that included video-assessment. In the 1990s social learning theories were important, and medical teachers took on ever more roles and responsibilities (e.g., as teachers, clinicians, and administrators). Instructional development programs were set up to facilitate student learning, to develop the function of teachers as role models, and to improve assessment measures. These programs also included peer coaching. From 2000 onwards the major trend was professionalism (e.g., patient-centeredness, cultural competence), in which teachers were expected to develop as competent professionals. Instructional development programs were tailored to individuals and focused on measurable outcomes, teaching portfolios, and medical educational research skills.

3.1.1 Available knowledge-for-practice on instructional development

A large body of literature on instructional development programs and their effects is available. Various reviews state that various instructional development

programs differ in their effects on teachers (e.g., Bloom, 2005; Prebble et al., 2004; Steinert et al., 2006; Stes, Min-Leliveld et al., 2010; Weimer & Lenze, 1997; Wood, 1998).

Designing instructional development programs that are in line with what is known from research can improve the effectiveness of the programs. These research results are called *knowledge-for-practice*, and are based on the literature (see Section 1.3.3. for more explanation). Relevant knowledge-for-practice is available on teachers' needs or preferences (Foley & Gelula, 1997; McLeod et al., 1997; Steinert et al., 2006), and on relations between instructional development programs and the quality of teachers. Many studies are available on how to increase the effectiveness of instructional development programs (e.g., Desimone, 2009; Guskey, 2000; Guskey, 2003; Hawley & Valli, 1999; Loucks-Horsley et al., 2003; Prebble et al., 2004; Steinert et al., 2006). In the review by Kennedy (1998) a relation between the content of the program and teachers' learning was suggested. In her research, Kennedy did not find a link between the format of a development program and teachers' learning. The importance of content in the design of instructional development programs was also pointed out by Meiers and Ingvarson (2005). Longer-lasting instructional development programs in medical education seem to have a long-term impact (e.g., Gozu et al., 2008; Simpson et al., 2006). Knight, Carrese and Wright (2007) showed that a great majority (82%) of the 242 medical teachers that had attended a 10-month program of one half day per week reported an impact on their professional life in either their intrapersonal or their interpersonal development, their development as a teacher, or their career. This effect was long-lasting as well: six to thirteen years after completing the program the teachers were more likely than the control group (non-participants) to report having developed and implemented curricula in the past five years, and having performed a needs assessment when planning a curriculum. They also rated themselves higher on developing, implementing, and evaluating curricula (Gozu et al., 2008).

Knowledge-for-practice, however, is often developed without taking context or specific conditions into account. Professionals such as teachers and teacher educators do not always see the relevance of the research results. They find it difficult to implement the results reported in the literature when designing instructional development programs in their institutions. Writers of professional literature and reports can to some extent bridge this gap, as they popularize and summarize the literature (e.g., Garet, Birman, Porter, Desimone, & Herman, 1999; Hill & Cohen, 2005; Sanders & Ardts, 2008). There are also a few research journals that reserve space for some "more easy-to-use articles", such as the 'Twelve tips series' in *Medical Teacher* (e.g., (Ramani, 2006; Ramani, Gruppen, &

Kachur, 2006), or the special editions of the journal *Medical Education*, called the “*Clinical Teacher*” (e.g., Salerno-Kennedy, Henn, & O’Flynn, 2010).

3.1.2 Taking into account teacher educators’ practical knowledge

Besides the knowledge-for-practice derived from literature, teachers and teacher educators also have personal knowledge about teaching. This knowledge can be described as practical knowledge (knowledge-in-practice). Professionals have this knowledge as a result of their experience as trainers and their reflections on this experience (Fenstermacher, 1994). Meijer et al. (1999) defined this knowledge as knowledge and beliefs (about teachers’ teaching practice) that underlie teachers’ actions. They stated that this knowledge is personal, related to context and content, often tacit, and based on (reflection on) experience. Meijer et al. (1999) identified three types of practical knowledge: (a) knowledge of subject matter, (b) knowledge about the learners, and (c) knowledge about how those learners learn and understand. Although practical knowledge is related to individual experiences and context, it includes elements that are shared by all teachers or groups of teachers (Verloop et al., 2001).

In this study we focused not on the medical teachers, but on the teacher educators of those medical teachers, i.e., on teacher educators’ practical knowledge of teaching. They have knowledge and beliefs that underlie their teaching in instructional development programs, for example on how to teach medical staff in specific programs. They have experience of what works well (e.g., best practices) and they are also aware of the challenges inherent in designing instructional development programs within the specific medical context.

3.1.3 Research question

In this study we intended to add to the available body of knowledge by combining teacher educators’ practical knowledge on best practices with the available literature about effective program characteristics. This was done in order to select characteristics of effective instructional development programs that are considered relevant in the specific context, and to obtain descriptions of those characteristics. Such an integration of knowledge-in-practice of the teachers (educators) with knowledge-for-practice as derived from the literature could lead to a more profound knowledge base of teaching (Verloop et al., 2001).

Our research question was:

Which characteristics of effective instructional development do teacher educators consider most relevant when designing actual instructional development programs in medical schools?

3.2 METHOD

In all medical schools (n=8) in the Netherlands we conducted interviews with experts on the design of medical instructional development programs. These experts were teacher educators that were members of the special interest group on instructional development of The Netherlands Association for Medical Education (NVMO), and who were also responsible for instructional development in their medical schools. They were mostly involved in the training of medical teachers.

The interviews (see Appendix C for the protocol) with the teacher educators in the eight medical schools were conducted in 2008. In general the interviews took from one hour to one hour and a half. In order to elicit the practical knowledge of the teacher educator two strategies were used in these interviews. First, the teacher educators were explicitly asked to select, from a list of 35, those characteristics that they considered the most important/relevant in their everyday practice. Second, they were asked to describe effective instructional development programs in their own medical school, using a 'best practice' (see Section 3.2.2), in order for us to identify possible (additional) relevant characteristics. In two cases the teacher educator was not the course leader of the specific best practice he or she had selected; in those cases the course leaders were also interviewed.

3.2.1 Identifying relevant characteristics

The teacher educators were explicitly asked to select (at least) three characteristics that they considered most important and relevant for the design of instructional development programs in their everyday practice. They made selections from a list of characteristics of effective instructional development programs that they had received before the interview was conducted.

These characteristics were based on the combination of the 9 characteristics identified by Steinert et al. (2006), and the 21 characteristics derived from Guskey (2003). This resulted in a list of 35 effectiveness characteristics, as presented in Appendix A. The procedure for constructing this list has been reported in Chapter 2.

To identify the characteristics the teacher educators regarded as the most relevant when designing effective instructional development programs we used a specific algorithm. In this algorithm a total of 100 points were to be distributed over the characteristics selected by every medical school. The characteristics that had the highest total scores were selected for the final list. If teacher educators chose more than three characteristics the additional characteristics were taken into account, but counted for only half.

3.2.2 Description of best practices

An additional strategy to gauge teacher educators' practical knowledge was to ask them to describe effective instructional development programs in their own words. We expected that asking them to describe a practical example from their own instructional development practice would enable them to explicate practical knowledge that was relevant in their own professional practice, and was not explicitly connected to their choices from the earlier list. As indicated in the introduction to this chapter, this knowledge-in-practice was seen as a valuable complement to the existing knowledge from the literature (knowledge-for-practice). The teacher educators were asked how they would ideally like to design instructional development programs in their own context, and to describe a selected best practice from their own medical context. The best practice had to be a program in the medical school selected by the interviewee, because it had to be an example of a current practice that, according to the respondent, was "effective", meaning that, in his or her view, the participating teachers learned from it.

All interviews were summarized and sent back to the interviewees for a check. After minor revisions all interviewees approved the summaries. Subsequently, the interviews, and specifically the descriptions of the design of the instructional development program, were coded using the program Atlas.ti. All sentences or sequences of sentences that related to a specific characteristic were coded, using a coding scheme consisting of the 35 characteristics of effective instructional development programs, with the possibility to add new codes on the basis of the analyses. During the process a first and a second coder discussed the results regularly; any differences were solved by reaching a consensus. No new characteristics additional to the 35 already incorporated in the coding scheme were found in the interviews.

Characteristics that were explicitly selected, and characteristics that were added because teacher educators described them often (>20 statements) in the interviews, were combined to form a final list of characteristics that are considered relevant to the design of instructional development programs.

3.3 RESULTS

3.3.1 Relevant characteristics as identified by the teacher educators

The teacher educators selected nine characteristics from the list as most important (Table 3-1). Characteristics derived from the review by Steinert et al. (2006) are indicated in the table by (S). For every characteristic, the number of schools at which it was mentioned and the number of statements about it are given (in

brackets). For example, eight medical schools had selected the first characteristic about providing systematic and constructive feedback, and in the interviews 27 statements were identified that could be linked to this characteristic.

Table 3-1. Characteristics Selected by Teacher Educators

Characteristics	
1.	It provides systematic and constructive feedback (8/27) S
2.	It uses alternative practices other than traditional methods, such as workshops and seminars (7/37) S
3.	It is based on teachers' needs (7/36) G
4.	Practicing what the teacher has learned has a prominent position (7/28) S
5.	It takes the context in which the teacher works into account (7/18) S
6.	It includes personal support (5/14) G
7.	It promotes reflection on teachers' teaching practice (5/12) G
8.	It is ongoing, hence a structural part of the teacher's work (3/4) G
9.	It provides opportunities for theoretical understanding of the programs (3/3) G

Notes:

S: derived from Steinert et al. (2006) G: derived from Guskey (2003)

In brackets: number of medical schools/number of statements

From the statements in the interviews, descriptions of the characteristics could be derived as identified and discussed by the teacher educators. These descriptions provided us with information about what the various characteristics mean to the teacher educators. Thus, the interviews were used to identify contextualized specifications of those nine characteristics. We will now summarize what the teacher educators said about the nine characteristics in the interviews; if applicable, some summaries are accompanied by illustrative quotes.

1. Systematic and constructive feedback

In all medical schools teacher educators mentioned feedback as important in the interviews. Two different issues were mentioned in relation to providing systematic and constructive feedback. First, interviewees said that practicing feedback skills would develop these skills in the teachers. Second, they stated that teachers would be able to change their behavior with the help of

individual feedback from various stakeholders (students, colleagues, and teacher educators). An illustrative quote from the data:

Receiving feedback is the only way to advance [in teaching] (...). First, a student or colleague can observe and provide feedback, and later a trainer could be asked. (Albert)

2. *Alternative practices*

As alternatives to the “traditional” methods the teacher educators mentioned other practices, such as workshops and seminars. Ideas for alternative methods derived from the interviews were: the use of portfolios, observing teaching sessions so that teachers could receive feedback, and the use of new formats such as role plays, individual coaching, peer group sessions, and online sessions (e-learning/blended learning). One of the teacher educators indicated that e-learning was an important part of his selected best practice: these sessions increased efficiency, because the online sessions would reduce the number of contact hours.

3. *Based on teachers’ needs*

Two topics were addressed in the interviews in relation to taking teachers’ needs and teachers’ competences into account. Teacher educators recommended, first, asking teachers before the program what their learning needs were, and second that if teachers wished to develop their competences they themselves should be responsible for selecting and requesting the appropriate instructional development programs.

4. *Practicing*

Teacher educators indicated the importance of practicing new knowledge and skills in instructional development programs. By applying what had been learned, by practicing skills and receiving feedback, teachers would be able to transfer what they had learned to their everyday practice. Two settings for practicing were mentioned: the work context (e.g., through homework) and the instructional development program.

Teachers are often very quick in thinking that they can do it [teaching]. It is important to let them experience what they can and cannot do. They are often “unconsciously incompetent”. They can often talk about it very well (e.g., when they provide feedback), but when they actually have to do it they experience how hard it is. Then they often see what they still need to learn. (Alice)

5. *Work context*

Teacher educators mentioned that the teachers' work context should be taken into account. They mainly referred to "practical" issues such as taking into account the amount of time teachers spend on research or patient care, and the fact that instructional development should be based on experience on the work floor.

Clinical teachers are busy with patient care, research, and education. For them you have to design instructional development programs in a flexible way, so that it fits into their daily work, and does not interfere with their other tasks. (Walter)

6. *Personal support*

Teacher educators mentioned personal contact and support in their interviews. To provide teachers with individual and personal support, teacher educators suggested using individual coaching, mentoring, or personal interviews.

7. *Reflection*

Teacher educators mentioned that reflecting on teaching can make teachers more conscious of their own functioning in practice, and that they consider it important for improving their own teaching. They suggest that reflection should focus on student learning and that involving colleagues in the process can be a productive strategy.

8. *Ongoing*

According to the teacher educators, being continuously engaged in constructing instructional development programs ensures that it is a structural part of the teacher's work. This will enhance teachers' continuous growth (e.g., through reflection or repeated attendance).

The purpose of instructional development should be to improve the way the teacher teaches [in small groups] and to find out how teachers can develop in the organization (...) They should learn to use various sources [colleagues, the literature] so that they can continue to develop as teachers. (Denise)

9. *Theoretical background*

Explaining the theoretical background of the strategies used in instructional development program helps teachers to understand their purpose. Thus, according to the educators providing opportunities for theoretical understanding of the programs is important in instructional development programs.

Teachers should not only be taught “the trick”. They also have to know why they do something. (Alice)

Table 3-2. Descriptions of Best Practices

Best practice
<p>Short Workshops</p> <p>Three short (2.5 hours) sessions (over 7 months) on developing assignments for groups of 5 (medical) teachers. The assignments are based on teachers’ own needs.</p> <p>Two-day course (inside 1 month) on basic pedagogical knowledge for a group of 12 clinical teachers. Concrete feedback from students and colleagues, using a case from the participants’ everyday practice, is part of the program.</p> <p>Two-day course (over 6 months) on basic pedagogical knowledge for a group of 18 clinical teachers. Various stakeholders were involved in the design process: educationalists, doctors, and behavioral scientists.</p>
<p>Lesson Observations</p> <p>An educational advisor observes two lessons (within 1 week) and provides individual feedback to the (medical) teacher. Observation of the actual everyday practice is the key feature here.</p> <p>Trained students attend one lecture and provide individual feedback to the clinical teacher. This stimulates teachers to take students into account more often during their teaching.</p>
<p>Long trajectories</p> <p>Certificated trajectory (2 years) on basic pedagogical knowledge for a group of 18 (medical) teachers. It includes workshops, peer group sessions, and individual coaching. E-learning is an important part of the trajectory, and intended to increase the efficiency of sessions.</p> <p>Trajectory (1 or 2 years) for a group of clinical teachers on basic teaching skills for small-group teaching. It includes group sessions, individual sessions, and coaching. Exchange of experiences is important. This program is still in the planning phase.</p> <p>Certificated trajectory (1 or 2 years) in which individual (medical) teachers construct a portfolio on their teaching practice, including evaluation forms, lesson plans, feedback, reflection, and description of instructional development programs attended. The trajectory is compulsory for new teachers, and the portfolio needs to be renewed every 5 years.</p>

3.3.2 Best practices

In every medical school the teacher educators selected a best practice as an example of a successful instructional development program carried out in real day-to-day medical practice. Table 3-2 shows the best practices selected. These could be divided into three groups: (a) short workshops, (b) lesson observations, and (c) long trajectories. Three of the practices selected were classified as short workshops: a specific topic was treated for a group of teachers. Two best practices could be described as lesson observations: an educational advisor or a student observed a specific lesson given by a teacher and provided individual feedback. The last three best practices could be classified as long trajectories: teachers participated for a long period (1 or 2 years) in a varied instructional development program, which could include portfolios and group as well as individual sessions.

Teacher educators reported that teachers were enthusiastic about the best practices selected, and generally learned from them. However, not all teacher educators were able to say for sure if teachers had also changed their teaching behavior, or if the program had had an impact on the students.

3.3.3 Additional characteristics identified in the interviews

The descriptions of effective instructional development programs in the context of the above-mentioned best practices were used to identify additional characteristics that teacher educators considered relevant, and that had not explicitly been selected during the process described in Section 3.3.1. On the basis of the number of statements made (>20), six additional characteristics were identified (Table 3-3).

Table 3-3. Characteristics Identified in the Interviews

Characteristics
1. It enhances teachers' pedagogical knowledge (8/36) G
2. Sufficient time is provided (8/26) G
3. Multiple methods are used to achieve the objectives (7/25) S
4. Participation is compulsory (7/21) S
5. Facilities and materials (resources) are well taken care of (7/21) G
6. Collaboration with peers is effective (6/21) S

Notes:

S: Derived from Steinert et al. (2006) G: Derived from Guskey (2003)

In brackets: number of medical schools/number of statement

1. *Pedagogical knowledge*

Three points were mentioned concerning pedagogical knowledge. First, teacher educators described ways of using specific pedagogical theory in the instructional development programs; second, they talked about improving the link between theory and practice in the instructional development programs; and third, they talked about which specific topics would be interesting to address in the program. This third point was raised many times by the teacher educators; these specific topics included for example assessment, feedback, and small-group teaching.

2. *Time provided*

Teacher educators in all medical schools addressed the importance of taking the time factor into account in instructional development programs. They gave suggestions for scheduling instructional development programs. For example, teacher educators should be flexible, part of the program should be put online, and half-day sessions were recommended that would be scheduled in the afternoon or evening.

Part of the theory can be offered using the internet (...). This makes it possible to shorten the [face-to-face] session. A session should not last more than half a day. (Albert)

3. *Various methods*

A wide variety of methods were recommended for inclusion in the design, such as workshops, role-playing, and e-learning. Moreover, teacher educators emphasized the need to combine methods in order to make them more effective.

Coaching is the cement between the various parts [of the course], resulting in an integrated package. (Ina)

4. *Participation is compulsory*

Teacher educators mentioned two ways in which the commitment of teachers participating in instructional development programs could be enhanced. One way is to stimulate teachers to have a positive attitude (e.g., motivation) to learning. Another way is to make the program compulsory by means of accreditation points or pressure from the organization.

You have to make it compulsory, otherwise teachers won't come. (Denise)

5. *Resources*

Taking resources (facilities and materials) into account was mentioned many times by the teacher educators. They mentioned for example the importance of

a professional organization that communicates well (e.g., website), good catering (e.g., tea and coffee), and well-written teaching materials.

The logistics of the instructional development trajectory should be professionalized: information about the courses and materials as well as registration should be handled via a website. (Albert)

6. *Collaboration*

Collaboration with peers was reported by the teacher educators as a good way to share experiences and ideas with others. According to the teacher educators the teachers can learn from these exchanges.

Exchanging [ideas] with others is important. Teachers can tell each other how they work and what difficulties they experience, and give examples from their day-to-day work. (Denise)

3.4 CONCLUSIONS AND DISCUSSION

The aim of the study described in this chapter was to identify which characteristics of effective instructional development were considered most relevant for the design of instructional development programs in medical schools. We did this by using teacher educators' practical knowledge, asking them to select characteristics and to describe an effective instructional development program in their own medical schools.

Nine characteristics were selected (Table 3-1) by the teacher educators from an existing list of characteristics of effective instructional development programs. In all medical schools, teacher educators mentioned systematic and constructive feedback as relevant in the design of instructional development programs. They addressed the development of teachers' feedback skills, and indicated that teachers were indeed able to change their behavior as a result of receiving individual feedback. Alternative practices such as blended learning were also mentioned by almost all medical schools as very relevant. This is in line with Bos, Van Batenburg and Molenaar (2010), who found that medical teachers were willing to participate in those courses, as they would fit well into the medical context, e.g., fit their busy schedules (Dede, Ketelhut, Whitehouse, Breit, & McCloskey, 2009). Teacher educators indicated that it was also important to base instructional development on teacher's preferences (cf. Chapter 2), and that practicing in the working place should have a prominent position.

Interestingly, characteristics (8) "it is ongoing" and (9) "it provides opportunities for theoretical understanding" were selected by the teacher educators as most relevant, but during the interviews only three educators described these in more detail. It is possible that teacher educators are aware of the importance of these characteristics, but find it difficult to implement

them in practice. It may be the case that organizational constraints impede the implementation of instructional development that is ongoing, and that teacher educators find it difficult to integrate their pedagogical knowledge into the activities.

In every medical school the teacher educator selected a best practice as an example of an existing, effective instructional development program. Six additional characteristics were derived from the interviews, in addition to the nine already selected. We expected that asking teacher educators to describe a best practice would enable them to explicate new practical knowledge that they found to be relevant in their own professional practice, in addition to the characteristics they had explicitly chosen from the list. In describing their best practices teacher educators in all medical schools mentioned that enhancing teacher's pedagogical knowledge and providing sufficient time were important. The number of statements in the interview about teachers' pedagogical knowledge was 36. This seems to be in line with Kennedy (1998), who mentioned that the content of a program was more important than its format.

Of the six characteristics, teacher educators mentioned collaboration slightly less frequently than the other aspects. According to the literature, sharing experiences with others is an important feature of learning (Prebble et al., 2004; Taylor et al., 2007). This feature may be more difficult to implement in current forms of instructional development, which might be the reason that teacher educators did not mention it often in their interviews.

Using teacher educators' practical knowledge (knowledge-in-practice) to connect the available literature (knowledge-for-practice) to their own context resulted in a list of fifteen characteristics that, according to the teacher educators, should be taken into account when designing more relevant and effective instructional development programs. The characteristics derived from both Steinert et al. (2006) and Guskey (2003) proved a good basis for this. Characteristics from both reviews were selected and used in the descriptions of effective instructional development programs.

3.4.1 Suggestions for further research

Teacher educators did not mention the student perspective much in their interviews. This is interesting, as students are the target group of teaching and can be a useful source of information for teachers. From the literature we know that student ratings (as well as other feedback from students) can provide teachers with feedback, advice, and support (Prebble et al., 2004) to improve their teaching. From research we also know that student evaluations can be useful, valid, and reliable (Menges & Austin, 2001). In further research it would

be interesting to investigate why the student perspective is not mentioned as important for effective and relevant instructional development programs.

The results presented in this chapter can provide teacher educators with some guiding principles for designing and implementing programs. Yet, we also agree with the following statement from McLean et al. (2008, p. 580): “We are far from being able to provide the ideal program as there is no *quick fix* or *one-size-fits-all* model of instructional development. Each school will need to work within its unique context”. We therefore believe that in every school the practical knowledge of relevant professionals can help to develop this “ideal instructional development program”.

In future research it would be interesting to examine new or existing instructional development programs in which these findings are taken into account during the design process, and thus also pay attention to the effectiveness of the instructional development program.

