The SpeakTeach method: Towards self-regulated learning of speaking skills in foreign languages in secondary schools: an adaptive and practical approach

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Chapter 6

General conclusions and discussion

6.1 Aims and research questions

Guiding students to become autonomous learners in learning to speak foreign languages is an important goal in foreign language education (Holec, 1981; Lee, 1998; Little, Dam & Legenhausen, 2017), but difficult to realize in regular classroom settings in secondary schools. The objective of this thesis was to design and evaluate an approach for self-regulated learning of speaking skills that is adaptive for secondary school students and practical for teachers in their regular teaching practice. The main research question addressed in this thesis was therefore: What are the design principles for an approach for self-regulated learning of speaking skills in a foreign language that is adaptive for students and practical for teachers?

In order to answer this main question, a pilot study was conducted into a possible adaptive approach in which self-evaluation by students, one of the design principles of the adaptive approach, was tested in the classroom (Chapter 2). Then on the basis of the pilot and further literature, the adaptive approach was developed and tested in the classroom. Chapter 3 reported on the development of a practical adaptive approach for teaching speaking skills in a foreign language, and the evaluation of its practicality. Chapter 4 reported research into the adaptivity of the approach for students. Chapter 5 focused on another aspect of practicality, i.e. the investigation of how teachers could be supported to expand their teaching repertoire with variants of the adaptive approach and could follow individual learning routes. The main findings per chapter are summarized below (6.2) and followed by answering the main research question (6.3). Theoretical implications, limitations and suggestions for further research are discussed in 6.4. Finally, in 6.5, practical implications are specified.

6.2 Main findings per chapter

Main findings chapter 2

The pilot study in chapter 2 reported on self-evaluation by students as a design principle for a possible adaptive and practical approach for speaking skills in a foreign language, which was based on a review of the research literature. The study explored whether the students' self-evaluations, each containing a diagnosis of a recording of their own speaking performance, a plan for improvement, desired working format or request for teacher's assistance, could help teachers to gain insight into individual students' needs regarding speaking skills and to adapt their intended feedback to meet these needs. The results of this pilot study showed that the

use of self-evaluation by the students to help teachers adapt their feedback was promising, because teachers reported that their students' self-evaluations increased their understanding of the students' learning process in speaking skills and they modified their intended feedback after seeing the self-evaluations in order to meet individual students' needs. Furthermore, teachers also considered the self-evaluation process to be feasible and practical in teaching practice.

This pilot study gave insight into the first design principle, self-evaluation by the student. In the second phase of the research, based on reflection on the results of the pilot study and on theoretical research, other design principles to make the approach adaptive for students and practical for teachers were then elaborated and tested in the classroom. To what extent the approach is indeed practical for teachers has been reported in chapters 3 and 5. Students' experience of adaptivity is reported in chapter 4.

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Main findings chapter 3

Chapter 3 reported on the development and evaluation of a practical adaptive approach to teaching speaking skills in a foreign language. The teaching approach to be developed aimed at providing both students and teachers with insight into the learning process so that feedback and improvement activities could be tailored to students' learning needs, as well as providing opportunities for students to improve their speaking performance in an aligned set of learning activities. Based on insights from research into bounded rational and ecological rational decision-making (Todd & Gigerenzer, 2012) and practicality theory (Doyle & Ponder, 1977; Janssen et al., 2013), a *Bridging Model* was used to develop the practical and adaptive teaching approach. Following this *Bridging Model* (Janssen, Westbroek, Doyle, & Van Driel, 2013; Janssen, Westbroek & Doyle, 2015), the regular teaching practice in speaking skills was first broken down into building blocks. Building blocks are recognizable lesson segments, in this case of regular language lesson series, such as input (reading texts or listening fragments), exercises (for instance focused on grammar or vocabulary), speaking activities and feedback. The next step was to design principles aimed at achieving the goals of the new teaching approach. These principles had to allow the building blocks to be incorporated into the existing teaching practice in various ways so that the teachers could adapt the teaching approach to their own teaching practice. Three practical design principles were formulated to achieve the

objectives of the teaching approach: 1) add a self-evaluation by the student to a speaking activity; then on the basis of this self-evaluation, provide 2) activities for improvement and differentation; and 3) adaptive feedback. After that the students do the same or a similar speaking activity again with self-evaluation. This can be repeated in an iterative learning process. The adaptive approach developed with the three design principles was called the *SpeakTeach* method.

The study reported on the practicality of the developed adaptive teaching approach. The research questions of this study focused on how the three design principles of the adaptive teaching approach were implemented by the participating teachers, what considerations they took into account, and to what extent they perceived the adaptive teaching approach as practical and resolving their problems with regard to teaching speaking skills.

The results showed that in almost all lesson series in which the teachers applied the new teaching approach, the essence of the teaching approach was retained. All three design principles were implemented by the teachers in their teaching practice and adaptive considerations played a role, in line with the purpose of the teaching approach. Teachers used the three design principles to produce many different variants of the *SpeakTeach* lessons in order to tailor the teaching approach to their students and to suit their own teaching style and practices. Thus, the flexibility of the building blocks and design principles was indeed utilized.

Moreover, teachers perceived the approach as practical, more desirable than their regular teaching practice and not more difficult to implement than their regular teaching practice. Class size, organization, keeping order and keeping students actively engaged were practical disadvantages mentioned for their regular teaching practice, but not mentioned for the new approach. Insight into the learning process and being able to tailor to students' needs were mentioned as advantages.

Main findings chapter 4

In chapter 4 the self-evaluation procedure of the developed teaching approach (the *SpeakTeach* method in chapter 3) was approached from the perspective of the students. It addressed the question of whether self-evaluation can be an adaptive resource for students at secondary schools to learn to improve their speaking skills in foreign languages and to improve their self-regulation of their learning. In a quasi-experimental study, we investigated

to what extent changes occurred in student self-regulation in improving their own speaking skills after four iterations of the self-evaluation procedure, and to what extent the students perceived the self-evaluation procedure as motivating and the received feedback and support as adaptive to their needs.

The results of this study showed that during the self-evaluation procedure students' perceptions of their learning needs did indeed change. An important goal of the self-evaluation procedure was to support secondary school students to become more and more independent in fulfilling all of the different parts of the process of self-regulation. It was found that the perceived need for teachers' assistance did indeed decrease and the preference for independence increased over the course of a number of iterations of the self-evaluation procedure. Moreover, shifts in diagnoses and foci of plans were also found. It seemed that students expanded the focus of their diagnoses and plans. The study also showed that students perceived the self-evaluation procedure as motivating. Speaking anxiety did not decrease.

When asked in a post-test about adaptivity of feedback and improvement activities, students in the experimental group generally found the activities during speaking lessons tailored to their needs to the same extent as the control group, and they found feedback less tailored to their needs compared to the control group. However, when asked about a specific self-evaluation cycle during the intervention, most students of the experimental group perceived the feedback and improvement activities as adaptive. It can be concluded from this that the lessons in speaking skills over a whole period had not been considered by the students of the experimental group as more adaptive than usual, but the specific periods of working on the self-evaluation procedure had been experienced by them as adaptive.

Main findings chapter 5

This chapter also examined the practicality of the adaptive teaching approach, but from the perspective of individual teachers with the focus on their professional development. The question was posed as to how teachers can be supported to gradually expand their teaching repertoire with variants of the *SpeakTeach* method. For teachers' professional development it is important to take both teachers' goals and their current teaching practice into account. The ecology of the classroom demands that teachers realize several goals simultaneously in limited time and with limited resources. A new teaching approach has to fit in with these

contextual constraints and the personal goals of the teachers. Furthermore, it has been suggested that reforms should build on existing teaching practice and provide steps which enable the incorporation of the new teaching proposal (e.g. Bransford, Derry, Berliner & Hammerness, 2005). In this study, two interrelated principles were used to realize this: modularity and self-evaluation by the teacher. In order to see differences between the current teaching practice and the desired innovative teaching practice, both were represented in similar modules or building blocks (modularity) and evaluated by the teacher (self-evaluation). By recombining these existing building blocks in accordance with a number of procedures, different learning trajectories could be followed by the teachers to implement an innovative teaching practice. Since teachers differ in their circumstances and their goals, there would be a need for adaptive learning routes.

In this study, we investigated whether, within a development trajectory based on modularity and self-evaluation by teachers, adaptive learning routes could be realized in which teachers could achieve both the goals of the innovation (the adaptive teaching approach, the *SpeakTeach* method) and their own objectives in a way that fitted in with and built on what they were already doing in their teaching.

The results showed that almost all teachers (10 out of 11) succeeded in expanding their teaching repertoire in line with the goals of the innovation (the *SpeakTeach* method) and followed adaptive learning routes to their own satisfaction. We distinguished three different successful learning routes. First there were the *builders* who stayed close to their regular teaching practice and built stepwise on their routines towards a new teaching practice. *Innovators with big steps back* experimented with new practices at the beginning and then took big steps back. A related group, *innovators who refined*, also experimented directly with new practices but did not take big steps back afterwards. Instead they consolidated and refined the application of the procedures of the new teaching approach (the *SpeakTeach* method).

In conclusion, the professional development based on modularity and self-evaluation by the teachers enabled all teachers except one to follow their own learning routes in line with their goals and in line with their teaching practice and at the same time move in the direction of the intended innovation.

6.3 Design principles of the adaptive and practical approach

Considering the findings of all the studies together, in response to the central research question, the following design principles can be deducted for an adaptive approach for students to learn to self-regulate their speaking skills which is practical for teachers. They have been explained, underpinned and researched in this dissertation.

Design principles of the approach related to <u>adaptivity</u> to students' learning needs
In order to make the teaching approach for self-regulated learning of speaking skills <u>adaptive</u> for students, the approach contained the following design principles:

1. *Add a self-evaluation by the student to a speaking activity*

The self-evaluation consists of a diagnosis by the student of a recording of the own speaking performance, a plan for improvement drawn up by the student and a desired working format or request for teacher's assistance.

2. *Provide activities for improvement and differentiation*

On the basis of the self-evaluation with a plan for improvement produced by the student, the teacher offers activities for improvement in follow-up lessons or as homework. The improvement plans provide opportunities to meet the students' learning needs by differentiating according to type and number of improvement activities, working format and steering in the lessons.

3. *Provide adaptive feedback*

The ultimate goal of the approach is self-regulation and therefore the choice of focus, type or strategy of feedback has to be varied depending on the learner's development. The student's self-evaluation, plan for improvement, whether there is a request for teacher's assistance and any recording of the speaking performance, provide information for the teacher to tailor the feedback.

Furthermore, it is important that, after executing the plan for improvement, students redo the same or a similar speaking activity with self-evaluation to experience whether they have

progressed and to put into practice what they have learned. A new cycle of monitoring and improving can then begin (repetition of principles 1 to 3).

Design principles related to the <u>practicality</u> for teachers and the associated learning of the teachers

The design principles regarding practicality were twofold. First, the design principles for practicality for teachers related to the representation of the adaptive teaching approach for students' self-regulated learning of speaking skills. Second, they related to a professional development trajectory which enabled teachers to expand their teaching repertoire by explicitly building on what they already do and value.

In order to make the teaching approach practical, we drew on the *Bridging Model* (Janssen, Westbroek, Doyle & Van Driel, 2013; Janssen et al., 2015) which contains the design principle of modularity. The design principle of self-evaluation by the teacher was added to the *Bridging Model*. The interrelated design principles of modularity and self-evaluation allowed teachers to gradually adapt the approach to and integrate it into their teaching practice in a flexible manner.

1. *Use modularity for representing the regular and the new teaching approach*

Use modularity to parse the current teaching practice and the desired innovative teaching practice into similar modules or building blocks. A building block is a recognizable lesson segment of a regular language lesson series. By recombining these existing building blocks in accordance with a number of guidelines, teachers can take advantage of the flexibility of the design principles to adapt the approach to their own teaching.

2. *Start a professional development trajectory with self-evaluation by the teacher of the current teaching practice and the innovative teaching practice*

Modularity facilitates targeted self-evaluation by representing the current teaching practice and the innovation in similar building blocks of the same level of description. On the basis of the teachers' self-evaluations of the existing and their desired situations, the teachers formulate goals and intentions for improvement and chose how, in which steps, they integrate the building blocks of the innovation (the new teaching approach) into their teaching practice.

Furthermore, teachers' self-evaluations enable tailoring of a professional development trajectory to their needs as it provides information for both the teachers themselves and the facilitator of the professional development trajectory on what the teachers do, experience, wish to achieve and what tailored input and activities are needed.

Hence, the principle of self-evaluation was needed on two levels in this teaching approach: on the level of the students (self-evaluation by the students of their own speaking performance) as a design principle to make the teaching approach adaptive for the students; and on the level of the teachers (self-evaluation by the teachers of their own teaching practice) as a design principle to make the teaching approach practical for the teachers and the professional development trajectory adaptive for the teachers.

6.4 Theoretical implications, limitations and directions for future research

The aim of the research in this dissertation was to design and evaluate a practical adaptive teaching approach for self-regulated learning of speaking skills. In this section theoretical implications, limitations and directions for future research will be discussed first from the perspective of students and then from the perspective of teachers.

6.4.1 Theoretical implications for research on students

This study aimed at self-regulation. As in socio-cultural studies, a cyclical self-regulatory process is assumed. In previous research, the case has also been made for an iterative learning process in which learners gradually become more independent in self-regulating (e.g. Little et al., 2017). Other researchers have proposed a cycle of reflection and task-repetition in order to improve speaking skills (Goh & Burns, 2012; Goh, 2017). This study contributes to the development of knowledge about guiding students to become autonomous learners in learning to speak foreign languages, because it adds concrete design principles intended to facilitate such an iterative learning process, namely: adding students' self-evaluation of a recording of their own speaking performance, providing adaptive feedback and providing activities for improvement. The results in chapter 4 showed that students could actually go through this process of self-regulation more independently and that the focus in their evaluations and plans changed.

A limitation of the study is that it focused on self-regulation by a heterogeneous group of secondary school students. Further research should be carried out in order to identify any differences in terms of year and language. It might be that lower level students differ from higher classes in meta-cognitive skills and therefore differ in, for instance, degree of independence and need for assistance during the self-evaluation-procedure.

One of the concrete design principles to facilitate the self-regulatory process in the adaptive teaching approach was students' self-evaluation of their own recorded speaking performance. A theoretical contribution of this study is that it approaches self-evaluation differently than many other studies. Much research on students' self-assessment has questioned the accuracy of self-assessments. Low correlations have been frequently found between students' self-assessments and tests or other measures considered to be valid and reliable (Phoener, 2012: 611; Ross, 1998). In contrast, this study did not focus on the accuracy of students' assessments, but on students' perceived needs during a procedure which aimed at learning to self-regulate their own speaking skills. The self-evaluation procedure in this study therefore had a different focus from the more common self-assessments in a number of respects.

First, the self-evaluation addressed a specific speaking performance and not the student's speaking skills in general.

Second, in contrast to much previous research (e.g. Brantmeier, Vanderplank & Strubbe, 2012; Phoener, 2012; Ross, 1998), the self-evaluation did not use external standards, but a self-evaluation instrument containing non-normative criteria to get the students to reflect on various aspects of their speaking performance (message, vocabulary, grammar, pronunciation, fluency) and on areas for improvement and positive points using their own internal standards. On the one hand, the intention was to get students to think about their own performance, their own goals, what was needed and how to attain new goals (instead of ranking their performance to an external standard). On the other hand, these students' subjective evaluations provided insights for teachers about their current level and degree of self-regulation.

Third, many existing approaches to the use of self-assessment focus only on diagnosis of performance, whereas in this procedure students also produced a plan for improvement and stated what help they needed. Information for the teacher to adapt their teaching was therefore not only based on students' diagnoses of their speaking performance as in other

formative uses (e.g. Black & Wiliam, 1998; Nicol & Macfarlane-Dick, 2006), but also on students' improvement plans. The self-evaluation by the student was not just an instrument for diagnosis in this study, it was part of a whole evaluation procedure containing a learning pathway to improve the initial speaking performance. The aim of using self-evaluation with improvement plan in the adaptive approach was not only to provide information for the teacher to tailor their teaching, but to stimulate the students themselves to design and implement their own learning pathways in an iterative learning process.

The results in chapter 4 showed that students did indeed ask for less assistance from the teacher in later cycles and that the focus in diagnoses and plans changed. A limitation of the study was that the data were based on the estimates of what the students themselves thought they needed. It cannot therefore be concluded that the changes in learning needs that we found mean that the students had learned to assess themselves better and make better plans. As discussed in chapter 4, much research has shown that foreign language learners find it difficult to assess themselves (Blanche, 1988; Poehner, 2012; Ross, 1998). Further research should therefore follow students for a longer period of time and compare their perceptions with external standards in order to investigate how much progress they make in self-assessing their speaking performances. In addition, we did not measure how much the students' speaking skills had actually improved. Further research should aim to show whether, over time, the self-evaluation procedure does lead to students speaking better in the foreign language than students who do not follow the self-evaluation procedure.

In addition to student's self-evaluation, adaptive feedback was one of the design principles of the adaptive and practical teaching approach. With regard to the theoretical contribution in the field of feedback, this study focused on how feedback and activities can be tailored in complex classroom settings. In accordance with socio-cultural approaches, this study assumed that feedback should be tailored to the development of the students (Lantolf, Thorne & Poehner, 2015; Aljaafreh & Lantolf, 1994; Poehner & Lantolf, 2005). Socio-cultural studies often take place outside the classroom in one-to-one situations (e.g. Poehner, 2012). However, this study aimed at an adaptive approach in regular classroom situations. In order to provide adaptive feedback in classroom settings, teachers need to use a broad repertoire of feedback types and strategies to respond to their student's individual needs and the instructional context (Lyster, Saito & Sato 2013). For this reason, the intervention in this study had a broader scope than much research on feedback in the field of second language

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acquisition which has often investigated the effectiveness of specific feedback types or strategies (Lyster et al., 2013).

The findings regarding adaptivity of feedback and activities for improvement are inconclusive. On the one hand, the pre- and post-measurements showed no difference on students' perception of adaptivity of improvement activities between the experimental and the control groups (Chapter 4) but students in the experimental group found feedback to be less adaptive than students in the control group. On the other hand, the intermediate measurements which were carried out each time directly after the accomplishment of a specific cycle of the self-evaluation procedure did indicate that the students of the experimental group found both the feedback and activities to be adaptive. Possible explanations for these differences in findings relate to the research instruments, the students and the teachers. Regarding the instruments, the intermediate measurements focused on a specific cycle of the self-evaluation procedure and therefore may have probed the perception of adaptivity more precisely than the pre- and post-measurements which addressed a whole period of time and lessons in speaking skills in general. Another explanation relates to a change among the students of the experimental group. They might have become more critical through the self-evaluation procedure, by thinking about whether they had got what they needed. High expectations could have been raised among the students of the experimental group with regard to adaptivity of feedback and follow-up activities because they were asked to indicate their needs in the self-evaluations, while this was not asked of those in the control group. Finally, another explanation could be that the teachers from the experimental group could indeed have given more adaptive feedback but not enough. There could have been a number of reasons for this, for example because of inexperience and need for habituation to the new way of teaching, or because they lacked the time for adequate analysis of the self-evaluations and for devising adaptive feedback and learning activities. Follow-up research could seek explanations by, for example, questioning students and comparing students' preferences with regard to feedback and activities with observations of feedback and activities actually given.

6.4.2 Theoretical implications for research on teaching

This dissertation also has theoretical implications for research on teaching. In theories about implementation of educational innovations and teacher professional development, little

attention has been paid to how new educational practices can be incorporated into the complexity of the existing teaching practice (Janssen et al., 2015; Kennedy, 2016b). As a result, important aspects of reforms can be lost during their implementation (Fullan, 2007; Spillane, Reiser & Reimer, 2002). Because of perceived practical obstacles, teachers often fail to adopt reforms or alter them to such an extent that their essence is lost (Janssen et al., 2013). The results in chapter 3, however, showed that in this study nearly all teachers (12 out of 13) integrated all three design principles of the new adaptive approach into their teaching practice, found the approach significantly more desirable than their regular teaching practice and considered the adaptive approach no more difficult to implement than their regular teaching practice. These findings are unusual because teachers generally find it difficult to tailor lessons to their students' learning needs in speaking skills (Corda, Koenraad & Visser, 2012; Hoffman & Duffy, 2016). This was achieved by basing the *SpeakTeach* method on the *Bridging Model* (Janssen et al., 2013; Janssen et al., 2015), a methodology developed to make education reforms practicable by using the principle of modularity (Holland, 2012; Janssen et al., 2015: 139). In this modular approach a reform is described as far as possible in terms of existing segments, or building blocks, of regular teaching practice.

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The principle of modularity of the *Bridging Model* has already been successfully applied in previous research to make innovations practical: for a practical approach for open-inquiry labs (Janssen, Westbroek & Doyle, 2014a); for the concept-context approach (Dam, Janssen, Van Driel, 2013); for guided discovery learning (Janssen, Westbroek, Doyle, Van Driel, 2014b); and for whole-task-first teaching (Janssen, Hulshof & Van Veen, 2016). This study added a supplementary element: self-evaluation. This element was added on two levels: on the level of the students and on the level of the teachers. This is explained in more detail below and related to relevant research areas.

Regarding the self-evaluation by the students, the results in chapter 3 showed that the addition of the building block of self-evaluation by the students contributed to the practicality for teachers. In addition, the self-evaluations gave teachers deeper insight into the learning processes of all of their students which helped them to tailor feedback. This opportunity was created by students working independently and actively during the self-evaluation procedure giving teachers time to offer adaptive feedback and support. Moreover, since the approach took existing learning activities from regular teaching and incorporated them into a coherent body of learning activities around a speaking goal thereby increasing alignment in the lessons,

the teachers were able to apply the design principles with the available means and in the available time. The use of modularity meant that there was no prescribed *SpeakTeach* method but opportunities to use the core of the approach, the three design principles, in a variety of ways. The results showed that 12 of the 13 teachers made full use of those opportunities for variation in order to tailor their teaching to their students. They used the three design principles to produce many different variants of *SpeakTeach* lessons.

It should be noted with regard to these findings that the analyses in chapters 3 and 5, which investigated the extent to which teachers implemented the design principles of the adaptive approach, were based on teachers' data about their own design of the lesson series. In further research, teachers' behaviour could be observed to find out how they implemented the teaching approach in their lessons. Furthermore, which feedback and activities the students actually received to improve their speaking performances was not investigated. Follow-up research examining teachers' choices regarding the kind of feedback and the concrete provision of learning activities on the basis of the students' plans, would provide more insight into how teachers tailor their feedback and activities to learners' needs. In line with this, it would be interesting to investigate how to get the iterative process of self-evaluation followed by feedback and improvement activities to bring about an increasingly higher level of attainment of the speaking goals.

On the level of teachers, the principle of teacher self-evaluation was added to the *Bridging Model* in order to make the teachers' professional development trajectory adaptive to their needs. An adaptive approach to professional development is being recommended which attunes to the *goals* and to the *current situation* of the teachers (Kennedy, 2016a; 2016b; Janssen et al., 2013), but it is acknowledged that it may be difficult to realize in the context of an innovation. In their model of adaptive expertise, Bransford and Darling Hammond (2005; 2007) suggest a stepwise progression that balances the development of routines and innovation, but they do not discuss how such a learning route can be achieved and supported in a development trajectory. Teacher self-evaluation lets the teachers reflect on the advantages and disadvantages of their existing teaching practice in relation to the proposed teaching approach. Reflection on practice has been widely accepted as an important ingredient in professional development trajectories (Marcos, Sanches & Tillema, 2011). However, the difference between this and other approaches is the combination of the design

principles of teacher's self-evaluation and modularity. Both existing and innovative teaching approaches were presented in the same modules. This use of modularity enabled targeted self-evaluation and helped the teachers to see how to integrate the new teaching approach into their existing teaching practice. We conclude that this was successful, because the results in chapters 3 and 5 showed that almost all teachers did indeed integrate the teaching approach into their teaching practice.

In addition, in the same way that self-evaluation by students was one of the design principles to make the teaching approach adaptive and practical, self-evaluation by the teachers enabled the professional development trajectory to be tailored to the teachers' needs as it provided information for both the teachers themselves and the facilitator of the professional development trajectory about what the teachers did, experienced, wished to achieve and which tailored input and activities were needed. Instead of prescribing a certain method and activities, the self-evaluation allowed facilitator and teacher to make decisions together about the necessary guidance, input and activities and what the next steps could be. Since teachers are likely to differ in their existing situations and their goals, the study assumed that there was a need for adaptive learning routes. The data from the study showed that the teachers did indeed start from different regular practices with regard to the three design principles of the adaptive teaching approach and did indeed have different goals or needs. We can conclude from the results that the principles of modularity in combination with teachers' self-evaluation enabled all the teachers except one to follow different adaptive learning routes. Adaptive because, despite the differences in starting points, they were generally satisfied with the achievement of both the goals of the innovation and with the achievement of their other goals.

It would be interesting to observe and follow the teachers to see how they continue to use the three design principles of the adaptive teaching approach in their practice and to investigate whether the patterns in learning routes persist or change over the course of time in order to refine theory about teacher professional development.

In conclusion, this study adds a new pedagogy designed to support teachers in their professional development. Kennedy (2016a) distinguished four pedagogies for teachers' professional development: providing prescriptions; providing strategies accompanied by a rationale that helps teachers understand when and why they should implement these strategies; providing insight and presenting a body of knowledge. The approach in this study

adds a fifth pedagogy, namely: creating adaptive learning routes by means of modularity and self-evaluation in order to support teachers to implement an innovative teaching approach.

6.5 Practical implications

Since we opted for design research which targets the development of solutions to a practical educational problem as well as theoretical development, the research inherently has practical implications. The main research question asked for design principles for an adaptive approach that is practical for teachers. The practicality for teachers was tested in this study (chapter 3). The results showed that teachers and students could apply the design principles of the adaptive teaching approach, the *SpeakTeach* method, and that teachers intended to continue to use all or parts of the teaching approach. In addition, although it was not part of the scope of the current research and data have not been collected, it can be mentioned that already after the publication of the first articles, several teachers indicated that they were inspired and used the design principles of the *SpeakTeach* method in their practice (see epilogue). That suggests that teachers are keen and able to apply the approach in their practice.

Important practical implications of the application of the *SpeakTeach* method in teaching are that it provides teachers with opportunities to have more information about the learning needs of their students through the self-evaluations and this enables them to tailor their feedback to the students making it less ad hoc. The adaptive teaching approach also provides students with the opportunity to improve their speaking performance and do the speaking activity again. No matter how much time a teacher allows to carry out a *SpeakTeach* round (a 10-minute session, an entire lesson or several lessons), inherent in the approach is that after the speaking activity an improvement activity is done and then the speaking activity is repeated. The adaptive approach means that speaking tasks are not isolated tasks in a lesson or series of lessons, as it creates alignment between learning objective, speaking activity and other learning activities. As a result, speaking skills gain a more prominent position in lesson series. There is more focus on speaking skills, as teachers of the experimental group reported (see chapter 3). An important result was that the adaptive teaching approach provided students with opportunities to be more active while practising speaking foreign languages, because the approach requires all students to speak, relisten, evaluate, improve and repeat. Since the approach consists of existing lesson segments, other lesson content and skills such as reading, listening, grammar and vocabulary are integrated in an aligned set of learning

activities that serve the purpose of improving speaking skills as they are used as activities for improvement.

Furthermore, the students' self-evaluations with plans for improvement provided opportunities for more adaptive learning routes of students and, therefore, more differentiation of activities, feedback, pace, working methods and variation in the degree of steering. How much will depend on the teacher, the students and their context. Since all kinds of variations are possible with the design principles of the adaptive teaching approach, the teachers can adapt the approach to their teaching practice. This will also mean that there will be a lot of different *SpeakTeach* practices as a result (see chapter 3).

Regarding implications for professional development trajectories, this study showed how trajectories can be tailored to teachers' needs by using the principles of modularity and teacher self-evaluation so that teachers can follow adaptive learning routes.

The practical adaptive approach in this study was developed for speaking skills. The approach might be applicable to other foreign language skills. First of all, its flexibility and the way the teaching approach is made practical using the steps of the *Bridging Model* could be adopted for other pedagogical reforms. In addition, the way it ensures that feedback and learning activities can be tailored to meet students' needs, namely through an iterative learning process of self-evaluations followed by feedback and tailored improvement activities, could also be applied to different subjects as well as to other components of the modern foreign languages curriculum such as listening skills. Students could for instance analyse what they have done well and what they have not done during a listening test, a reading test or in a self-written text, then make an improvement plan and take the test again.

The design principle of self-evaluation could also be used systematically in other subjects. In STEM subjects, for example, students could evaluate their own practical research. The self-evaluations should make students aware of the steps they have to take and at the same time they should give the teacher insight into what the students notice and understand of their learning process and what needs to be improved. This would allow the teacher not only to give feedback on the research done, but also to give feedback on the students' reflections and guide them on a regulatory level.

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