

# The role of individual differences on the effect of synchronous coaching of trainee teachers in plenary situations

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**Abstract:** Historically, synchronous (direct) coaching is an addition to the traditional asynchronous (indirect) supervision of trainee teachers. The new trainee receives concrete hints on “how to proceed further” via an earpiece.

In this study the role of personality traits and the orientation of learning to teach by synchronous coaching of trainee teachers was investigated. Analyses showed that the personality traits extraversion, autonomy and emotional stability are indicators for preference in coaching mode. The study involves trainee teachers from various educational backgrounds in order to detect the more subtle differential effects. Each group of participants showed a different response to the synchronous versus asynchronous feedback and thus leads to the conclusion that there is a basis to tune the coaching of practical skills to personal factors indeed.

Trainee teachers with an orientation towards “closed meaning” in pedagogical skills appeared to benefit most from being whispered synchronously, followed by those with closed reproductive-, survival- and open meaning orientation.

**Keywords:** personality; teacher education; educational technology; synchronous coaching; feedback.

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## 1. Introduction

In competitive sports, including the Formula-1 car racing, synchronous (direct) intervention via a wireless earphone is used in addition to asynchronous (indirect) coaching. The main advantage of this coaching technique is that at any given moment, the driver has a complete picture on the progress of the race. However, trainee teachers do not receive synchronous coaching, even though this may have similar advantages as those in sport events.

The aim of this study is to investigate whether it can be predicted that a trainee teacher is suitable for synchronous coaching, given the personality traits and orientation of learning to teach. After all, learner characteristics play an important role in learning processes (Vermetten, Lodewijks, & Vermunt, 2001). Individual differences such as personality traits are also crucial in teacher training (Kourilsky, Esfandiari & Wittrock, 1996). Therefore, differentiation in coaching is essential because of individual differences between trainee teachers.

This study is part of a larger research project in the field of synchronous coaching of trainee teachers. Therefore, some previous findings are described first.

### 1.1. *Prior Results*

In a previous study (Hooreman, Kommers and Jochems; (accepted)) we investigated the effects of two coaching techniques (synchronous versus asynchronous) in plenary situations.

From the analyses it appears that the synchronous intervention has a more positive effect than the asynchronous coaching on the quality of the pedagogical action of the trainee teacher. Analyses show that in the synchronous condition there is a considerable progress between the two measurements (pre- and post-test) in 95% of the cases. This was 60% in the asynchronous condition. Trainee teachers who were labelled as “subcompetent” in the pre-test showed more progression in the synchronous condition than those in the asynchronous situation. Prominently the competencies “interpersonal competence” and “organisational competence” appeared to be improved significantly in the synchronous situation. This effect was less dominant for the “pedagogical competence”. The traditional asynchronous approach appeared to be more beneficial for “subject content competence”.

It also could be concluded that “cognitive overload” (Sweller, 1999, 2003) had not reached a critical level and it seemed a viable hypothesis that synchronous coaching via an earphone in the initial teacher training in plenary situations is superior as compared to the traditional asynchronous feedback mode.

### 1.2. *Learner characteristics and synchronous coaching*

The effect of intervening personality traits on the effect of synchronous coaching has not been investigated before, although it is supposed to play an important role in learning processes (Vermetten, Lodewijks, & Vermunt, 2001). According to prior research (De Raad, Hendriks, & Hofstee, 1992), the “Big Five” personality traits are:

- extraversion,
- agreeableness,
- conscientiousness,
- emotional stability and
- autonomy.

Based on the “Big Five” it is assumed that *emotional stability* is an important factor for predicting the preference for synchronous versus asynchronous coaching. Oosterheert (2001) demonstrated that the variable “personality trait” plays a particular role in deciding the optimal mode of learning to teach. “Emotional stability” is seen as the critical factor in it; the novice teacher with a higher degree of emotional control will not panic when being whispered in the ear synchronously. He or she will remain calm and will benefit from the information received via the earphone. Consequently, we expect that test subjects with high scores on emotional stability will benefit considerably more from synchronous coaching. *Autonomy* is about being creative, imaginative and autonomous. An indirect consequence of this is that the trainee teacher will be open to new experiences such as synchronous coaching (Hendriks, 1997). This factor is important in learning to teach as well as in learning & instruction (Busato, Prins, Elshout and Hamaker (1999). The next factor for which we expect that a high score corresponds to a high synchronous coaching effect is *extraversion*. Besides the proven importance in learning to teach and learning & instruction, a trainee teacher who is energetic, active and who actively attempts to convert the synchronous intervention into a changed behaviour, is obviously quite motivated for learning to teach and therefore suitable for the new synchronous coaching program.

According to Vermetten (1999), the qualities of *agreeableness* and *conscientiousness* are not critical for the mode of teacher training. Besides this, we expect that a trainee teacher who scores high on the factor agreeableness is less sensitive to synchronous interventions. Indeed, this factor exemplifies phenomena like being friendly, flexible and co-operative. There is a danger that a synchronous intervention is followed slavishly, without the trainee being aware whether the pedagogical action would actually be improved. The trainee teacher gets used to following the interventions blindly, so that the process of learning is hampered. Besides the unproven importance of conscientiousness in learning to teach, we expect that the combination of systematic and careful behaviour does not contribute to successful synchronous coaching. These trainees prefer structured educational surroundings where careful and cautious choices can be made. An unexpected sudden intervention conflicts with this ideal.

Individual differences in learning to teach have attracted attention of many earlier investigators (among others, Zanting, Verloop, Vermunt, & Van Driel, 1998). Our main conclusion is that synchronous coaching is an aid for optimizing individual learning processes. We assume that synchronous coaching is not ideal for all kinds of personalities and teacher styles. Indeed, Oosterheert (2001) distinguishes four “orientations of learning to teach”, each of which demands a specific role from the instructor. Table 1 shows that ‘learning to teach orientation’ is the second variable in this study, beside personality which can predict if a trainee teacher is appropriate for a successful exposure to synchronous coaching.

Predictor 1: (Personality Traits) Extraversion, Autonomy, Emotional stability, Agreeableness and Conscientiousness
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Predictor 2: (Learning to Teach Orientation) Closed Meaning, Closed Reproduction, Open Meaning and Survival
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Table 1 “Predictors of synchronous coaching effect”

We expect that trainee teachers with a *closed reproduction-oriented* learning orientation are most sensitive to synchronous coaching because this orientation doesn't stimulate the process of knowledge accumulation. Self-monitoring is hereby the key process; it fits better the assessment of the dynamic situations of lessons. Novice teachers typically strive towards improving their pedagogical actions based on their self- image as a teacher in ideal teaching situations. Discrepancies between one's ideal self image and one's real experiences are often ignored or addressed with a minimum of communicative effort. Synchronous coaching may help the trainee teacher to attain his/her target ideal on how to teach, even without spending lengthy discussions with the instructor.

*Survival-oriented* trainee teachers are less open to guidance by the instructor than those who are oriented towards closed reproduction. The effect of synchronous coaching is thereby reduced. Taking into account that they rather prefer ad hoc solutions to problems in all situations, the potential learning effect may still be relatively high. Based on this, we expect that this group is almost suitable for synchronous coaching as the closed reproduction oriented group.

The *closed meaning-* and the *open meaning-oriented* trainee teachers would not benefit particularly much from synchronous coaching considering that they have the competence of improving the quality of their pedagogical performance individually. Particularly the *open meaning-oriented* trainee teachers can optimize their learning process on their own without being subjected to synchronous coaching. Therefore, we expect that this aptitude of becoming a teacher benefits less from synchronous interventions. The *closed meaning orientation* has an intermediate effect, considering that a synchronous intervention may help to increase one's confidence with respect to one's own observations.

These notions entail to the following hypotheses:

- Hypothesis 1: Trainee teachers with a high score on the personality traits extraversion, autonomy and emotional stability respond better to synchronous coaching than those who score high on agreeableness and conscientiousness.
- Hypothesis 2: Trainee teachers with the survival- or closed reproductive orientation respond better to synchronous coaching than those with the closed meaning- or the open meaning orientation.

## 2. Method

### 2.1. Participants

The participants were 60 randomly selected 'bachelor of education' students. Forty of them received synchronous coaching, whereas the remaining 20 received asynchronous coaching.

It is possible to acquire a bachelor of education in three subject strands: science, language and social sciences. Each strand consists of different subgroups; for example the strand of "language" can be divided into French and English etc. Graduates are certified to teach a certain subject at high schools and institutions of primary and secondary vocational education.

### 2.2. Materials

For the assessment of personality traits the Dutch version of the Five Factor Personality Inventory (FFPI) was used. This questionnaire is composed of one hundred statements. Each trainee teacher is supposed to indicate on a five point Likert scale the extent to which each statement describes his or her personality. This instrument was selected because of its high reliability and validity in the Dutch context (Hendriks, 1997).

The Inventory Learning to Teach Process (ILTP) (Oosterheert, 2001) was the second questionnaire presented to study the learner characteristics of the participants. The ILTP consists of 52 items, divided into 10 scales. The first three scales concern experiences on learning to teach (learning conceptions). Scales 4 to 8 concern the mental learning activities that are pursued by the trainee teachers for steering these activities. The scales 9 and 10 measure how the trainee teachers cope with negative experiences in the classroom. The reliability of the instrument was characterised as "satisfying" (Cronbach's alpha of the individual scales > 0.7).

Fontys' competence assessment inventory is used to measure the improvement in the quality of the pedagogical action of the trainee teacher. This instrument describes seven competencies, which should be satisfied by a novice teacher. The accompanying behaviour indicator should also be looked at in order to evaluate whether a competence has been achieved. In this study, the quality of the pedagogical action was rated using a five point Likert scale. The two extremes (1) and (5) indicate that the teacher shows non-competent behaviour or that the teacher shows ideal competent behaviour without any doubt.

A film script with twenty written fragments was the finally-integrated instrument in this study. Per fragment, based on one behavioural indicator (Appendix 1), the teacher behaviour can be stated as non-competent. The 20 fragments were recorded on video in two ways. The two versions differed from each other on the basis of two criteria. Firstly, the sequence of filming the fragments was changed. Secondly, small changes were introduced in the fragments, without changing the indicator that points to non-competent behaviour. With regard to changes, one may consider to use various groups of actors and variations in the theme of the fragment. For example, in Version 1 the trainee does not want to elaborate on historical cemetery sites because of a recent death of his grandmother. In the corresponding fragment in Version 2 the trainee teacher is also

required to react patiently. However, the reason is not to allow sorrowing, but in this case: a fear of failure to give a presentation.

### *2.3. Design and Procedures*

#### *Pre-test*

The 60 randomly-selected trainee teachers (Groups 1 to 4, see Table 3) were individually presented with 20 fragments on paper. Per fragment, the teacher behaviour was referred to as non-competent in respect to one behaviour indicator.

Based on the described situations, the test subjects were asked to mention the indicator referring to non-competent teacher behaviour. An observer rated the quality of the explanation using the five point Likert scale of the competence assessment. Cohen's kappa for inter-rater reliability was 0.67.

#### *Experiment*

All trainee teachers received the two questionnaires (FFPI and ILTP) and responded to it in their leisure time. The groups were subjected to two conditions as described in Table 3. In the synchronous condition 20 video fragments (Version 1) were presented to Groups 1, 2 and 3. These video fragments were recorded on the basis of the 20 described fragments. After a fragment, the screen went blank and the test subject showed the observer his ideal teacher behaviour. The video fragment showed teacher behaviour that was particularly incorrect on the basis of one behaviour indicator. The respondent must show that (s)he is able to recognize and improve the incorrect teacher behaviour. If in the observer's opinion the quality of the trainee teacher's pedagogical action deserved a score of less than (5), then the keywords of the suggested appropriate behaviour indicator are whispered.

The participants in the asynchronous condition (group 4) were involved in a discussion if in the observer's opinion the manifested teacher behaviour was of low quality. This meant that the discussion was directed at the fragments based on which the teacher showed behaviour that received a score of lower than the maximum score of (5) from the observer.

#### *Post-test*

The test subjects were exposed once more to the video fragments (Version 2, see "materials"). Once again, after each fragment they were required to show how they would act in a comparable situation. Each video fragment once again contained non-competent behaviour on the basis of one exact behaviour indicator. The procedure was comparable with that of the experiment.

### *2.4. Data Analyses*

To determine the underlying structure of the "competence assessment", first a principal component analyses (varimax) was conducted, followed by a reliability analysis. Secondly, ANOVA (Bonferroni posthoc) was applied to obtain an insight into the differences in coaching effect between the various groups of test subjects (Table 3). Subsequently, correlations were calculated to see if there were any relationships between

personality traits and coaching effects. Using beta-weights, it was investigated if personality traits could predict whether the quality of pedagogical actions of the trainee teacher could be improved through synchronous interventions. Finally, a hierarchical agglomerative cluster analysis (Ward's method) was performed in order to see which learning to teach orientation matches best for a successful exposure to synchronous coaching.

### 3. Results

#### 3.1. Part 1: Description of main effects

##### 3.1.1 Reliability of the competence assessment

A principal component analysis (varimax) resulted in 7 components with an average Cronbach's alpha of 0.90. It was not necessary to remove items because the factor load of each item was  $\geq 0.4$ .

##### 3.1.2. Correlations between the personality traits and the coaching effect

###### Synchronous

The data in Table 2 shows that there is an overall correlation between the effects of synchronous coaching and the personality traits: extraversion and autonomy. It follows from the typical situation of a trainee teacher who scores high on these two personality traits benefited from synchronous interventions. Emotional stability also correlates with 5 of the 6 competencies with a successful exposure to synchronous coaching. This was only not the case for the competence "subject contents". Trainee teachers in the synchronous condition who score high on agreeableness improve the quality of the pedagogical action on the basis of the competencies "pedagogical competence", "organizational competence" and "reflection & development competence". The remaining 3 competencies ("interpersonal-", "external communication-" and "subject contents competence") did not improve in cases of the more flexible/friendly teachers. Finally, there was no significant relationship between conscientiousness and the synchronous coaching effect.

	<i>Synchronous coaching effect</i>					
	<i>Organizational Competence</i>	<i>Pedagogical Competence</i>	<i>Reflection &amp; development Competence</i>	<i>Interpersonal Competence</i>	<i>External communication Competence</i>	<i>Subject contents Competence</i>
Extraversion	0.77**	0.74**	0.51**	0.76**	0.53**	0.51**
Autonomy	0.63**	0.67**	0.59**	0.64**	0.54**	0.47**
Stability	0.78**	0.76**	0.62**	0.73**	0.69**	
Agreeableness	0.27*	0.40**	0.28*			
Conscientiousness						

\*Significant at the  $\alpha=0.05$  level \*\*Significant at the  $\alpha=0.01$

*Table 2 “Correlations between personality traits and the synchronous coaching effect/competence”*

### Asynchronous

In the asynchronous condition there was only one significant relationship between autonomy and the “pedagogical competence” ( $r=0.61$ ,  $p<.05$ ).

### Synchronous and Asynchronous

It can be concluded that those test subjects with high scores on extraversion, emotional stability and autonomy benefited synchronous coaching much more. The whole competence spectrum of these trainees shifted positively. Therefore it can be concluded that trainee teachers having these personality traits benefit extra from synchronous coaching. It is possible to apply the synchronous interventions on all aspects of the timing of the pedagogical actions.

Flexible/friendly (agreeableness) teachers should be coached synchronously on the competencies “pedagogical competence”, “organizational competence” and “reflection & development competence”. The remaining three competencies (“interpersonal”, “external communication” and “subject contents”) may be subjected to the traditional asynchronous coaching.

It is important to note that the two conditions (synchronous & asynchronous) show no contradicting results. As mentioned, a relationship between personality traits and the synchronous coaching effect is demonstrated by the results in Table 2. In contrast, the same relationship in the asynchronous condition is not occurring. Therefore, it appears that a trainee teacher who is both extravert, emotional stable and autonomous responds better to synchronous coaching than those who score high on agreeableness and conscientiousness.

### *3.1.3. The Relationship between the coaching effect and the learning to teach orientations*

A cluster analysis (Ward’s method) on the 10 scales of the Inventory Learning to Teach Process (ILTP) was used to identify relatively homogenous groups in the way trainee teachers learn how to teach. The 10 scales of the instrument were: 1) Practicing and testing. 2) Strong self-determination. 3) Raising conscientiousness under external control. 4) Proactive use of the mentor. 5) Independent search for conceptual information. 6) Actively relating theory to practice. 7) Developing views through discussion. 8) Pupil-oriented evaluation criteria. 9) Avoidance. 10) Pre-occupation. Cluster analysis led to four orientations in learning to teach. The detected orientations are: survival, closed reproduction, closed meaning and open meaning, increasing to the level of consciousness of one’s own learning process. Thus, trainees with a survival orientation generally act without awareness, whereas those with an open meaning orientation balance their decisions more carefully. The four orientations as far as the interpretation is concerned are comparable with those reported by Oosterheert (2001).

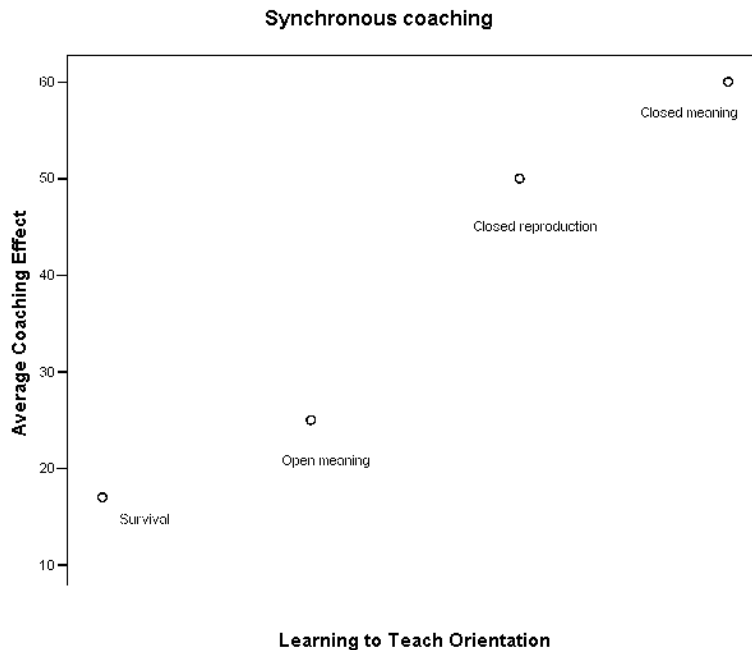
### Synchronous coaching



It can be seen in Figure 1 that the synchronous coaching effect was the strongest in trainees with the closed meaning orientation who were concerned over negative lesson experiences and who questioned their own observations. It also appears from Figure 1 that trainees with a closed reproductive orientation of learning to teach were particularly sensitive to synchronous coaching because they find that regular institutional meetings are poorly attuned to their individual learning process. However, trainee teachers with a survival- or open orientation towards meaning who prefer ad hoc solutions to problems and who can develop solid competence on their own do not particularly benefit much from direct interventions.

### Asynchronous coaching

It is likely that the pedagogical activity of trainee teachers with a survival orientation who prefer an ad hoc solution to problems will develop more positively in the asynchronous condition than in the synchronous variant. This is in contrast to the trainees with the closed reproductive- and closed meaning orientation who respond much better to synchronous coaching.



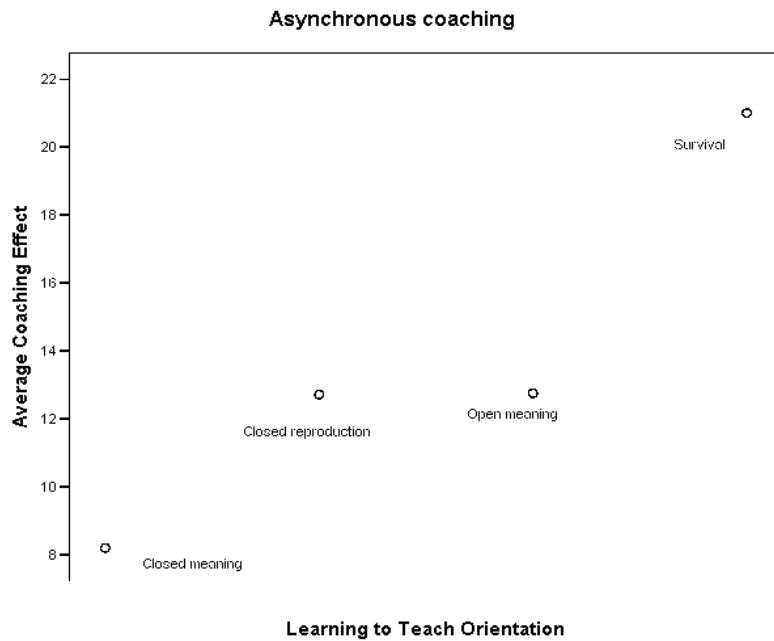


Figure 1 “Relation between average coaching effect and learning to teach orientations”

In summary it can be stated that trainee teachers with the closed meaning-, closed reproductive- and open meaning orientation preferably participate in synchronous coaching sessions. Trainee teachers with a survival orientation should be subjected to the classical asynchronous coaching.

### 3.2. Part 2: Distinguishing the Main Effects of Personality Traits

In Table 3 it can be seen that the 60 trainee teacher participants can be divided into four groups. It can be seen that a test subject in the asynchronous condition (Group 4) achieved less progress on the average than those in the synchronous condition (Groups 1, 2 and 3). Participants with a vocational prior education achieved the most progress as a result of coaching.

Group	Number (N)	Prior education	Year	Intervention (Synchronous/Asynchronous)	Average coaching effect
1	10	vocational	1/2/3	Synchronous	2.70
2	20	pre-university	2/3	Synchronous	1.48
3	10	pre-university	1	Synchronous	1.17
4	20	pre-university	2/3	Asynchronous	0.59

Table 3 “Participants and average coaching effect”

Table 4 shows that ‘personality traits’ explain the major part of the variance for the coaching effect of Groups 1 and 2. It is also possible to predict the effect of coaching intervention on the basis of one or more personality traits in Groups 3 and 4.

In the case of the second- and the third year students (Group 2) the effect of synchronous coaching is best predicted by autonomy ( $\beta=0.92$ ). However, high scores on extraversion and emotional stability also indicate that the expected yield of a synchronous intervention would be high. Agreeableness and conscientiousness seem not to play a predictive role.

The effect of asynchronous intervention (Group 4) could be predicted on the basis of autonomy and emotional stability. These two personality traits also had a predictive value in Group 2 (synchronous). However, the beta-weights are clearly lower in Group 4 (asynchronous). A high score on extraversion stresses the difference between the two groups (group 2 vs. group 4) considering that this personality trait has a predictive power ( $\beta=0.80$ ) only in Group 2 (synchronous).

In Group 1 (vocational education) agreeableness, extraversion and emotional stability predicted the success of the synchronous condition. In Group 3 (synchronous year 1) only conscientiousness predicted the synchronous coaching effect. A first year student who scores high on this trait and as a result operates carefully and systematically, is supposed to benefit from synchronous coaching.

In summary: the results of the analyses indicate that personality traits play a crucial role in the prediction of the coaching effect. The level of success of the intervention can be evaluated based on the results of a personality test if the group (1,2,3 or 4) to which the test subject belongs is known.

Group	<i>Beta-weights as predictors of Coaching effect</i>			
	1	2	3	4
Agreeableness	0.53*			
Conscientiousness			0.48*	
Extraversion	0.84**	0.80**		
Autonomy		0.92**		0.75*
Emotional Stability	0.81**	0.86**		0.46*
R <sup>2</sup>	0.75	0.94	0.23	0.57
<b>Adjusted R<sup>2</sup></b>	0.70	0.93	0.19	0.52
<b>F</b>	16.08**	84.36**	5.3*	11.32*

Group 1=Synchronous progression (vocational) Group 2=Synchronous progression (years 2&3) Group 3=Synchronous progression (year 1) Group 4= Asynchronous progression (years 2&3)

\*Significant at the  $\alpha=0.05$  level \*\*Significant at the  $\alpha=0.01$  level

Table 4 “Beta-weights of the Big Five personality traits as predictors of coaching effect of groups 1,2,3,4”

#### 4. Conclusions and discussion

The three synchronously coached groups (vocational, second-/ third year pre-university and first year pre-university education) all proved to enjoy a higher coaching effect than

those who were coached asynchronously. It can be concluded that, irrespectively of personality trait and orientation of learning to teach, in almost all cases synchronous coaching is to be preferred above the asynchronous condition.

However, this study also indicates that the coaching effect can be optimized for each individual by actually tailoring to his or her personality attitudes and orientation of learning to teach. The conclusion below serves as a guideline for optimizing the effect of synchronous coaching if the group (1,2,3 or 4) to which the trainee teacher belongs is known. Thereby an insight into the personality traits and orientation of learning to teach is essential. However this is possible through taking the Five-factor Personality Inventory (FFPI) (Hendriks, 1997) and the Inventory Learning to Teach Process (ILTP) (Oosterheert, 2001) into account.

### **Main effects (according to Hypothesis 1: personality traits)**

With respect to personality traits there is a significant relationship between extraversion, autonomy, emotional stability and the synchronous coaching effect. Subjects with high scores on these traits were successfully exposed to the synchronous intervention. Competencies, like “interpersonal competence, pedagogical competence, subject contents competence, organizational competence, external communication competence and reflection & development competence” improved in those who scored high on autonomy and extraversion. These competencies except “subject contents competence” also improved in emotionally stable trainee teachers. In a previous study (Hooreman, Kommers & Jochems, accepted) it appeared to be impossible for the trainee teacher to assimilate whispered suggestions on the subject matter in plenary teaching situations. An emotionally-stable trainee manages to remain calm if the coach whispers on the subject contents. The trainee ignores the information and concentrates on his planned story, thus avoiding the chances of “cognitive overload”.

In line with De Raad, Hendriks and Hofstee (1992), it follows from the above that an energetic trainee teacher who balances his actions carefully and is open to new experiences can benefit successfully from synchronous coaching, according to the observations in this study.

In general, however, there was no positive correlation between agreeableness, conscientiousness and the synchronous coaching effect. The competencies: “pedagogical competence, organizational competence and reflection & development competence” are an exception and can be improved by synchronous coaching in novice teachers who rate high on agreeableness.

### **The role of prior education (according to Hypothesis 1: personality traits)**

By contrasting personality traits to prior education, it finally enables us to predict whether a trainee teacher benefits from synchronous- versus asynchronous coaching. The distinction between the various types of prior education is justified because these groups enjoy different coaching effects.

Synchronously coached second- and third year trainee teachers who originated from a secondary school with high scores on autonomy, extraversion and emotional stability best indicated that synchronous coaching will lead to an improvement in the competencies “pedagogical competence”, “organizational competence” and “external communication competence”. The remaining competencies are optimally improved through asynchronous coaching. An optimal combination of synchronous and asynchronous coaching is achieved in this manner.

It is adequate to provide these trainees with the traditional asynchronous coaching when their score on autonomy and emotional stability is at least at a medium level. A first year trainee teacher with high scores on conscientiousness may be successfully exposed to the synchronous condition, provided the intervention is directed at the competencies “interpersonal competence” and “pedagogical competence”, as stressed above. The remaining four competencies may be improved by being submitted to the classical asynchronous coaching. Once again an optimal combination of the synchronous and asynchronous condition is achieved in this manner.

Finally, if the score on agreeableness is high, then asynchronous coaching is indicated, except in the case where the trainee teacher underwent vocational prior education.

### **Learning to Teach Orientations (according to Hypothesis 2)**

It appeared from our results that trainee teachers with the ‘closed meaning orientation of learning to teach’ benefit best from synchronous coaching. In a descending order the closed reproductive-, survival- and open meaning orientation of learning to teach proved to be suitable for synchronous coaching. Alternatively to Oosterheert & Vermunt (2002), it is possible to provide an explanation for the unexpectedly-high synchronous coaching effect on trainee teachers with a closed meaning orientation. They stress that these trainee teachers had serious concerns about negative teaching experiences and they also tended to doubt their own observations. They literally followed the advice of the institutional instructor because of a lack of self-confidence. They considered this external steering essential for functioning as starting teachers. Therefore, they obviously value whispering via the earpiece as an important complement to the traditional asynchronous feedback.

As expected, trainee teachers with a closed reproductive orientation can successfully be exposed to synchronous coaching. In this case synchronous interventions help in accumulating knowledge, which can be used to anticipate the dynamic situations in lessons. Besides, the trainee teachers with a closed reproductive orientation dislike regular institutional meetings because the practical information that is provided during these meetings is poorly attuned to their individual learning process. Synchronous coaching provides this information just-in-time.

Trainee teachers with a survival orientation of learning to teach respond considerably poorer to synchronous coaching than was predicted on beforehand. Trainee teachers with this orientation are expected to gain better results by asynchronous coaching than by the synchronous condition. Apparently, synchronous coaching does not help these trainees in ad hoc solutions to problems. They derive more value from what they automatically tend to do and see the new coaching mode as a threat instead. As

expected, the open meaning orientation seems not to be suitable for synchronous coaching. Indeed, these trainee teachers are also able to develop solid competencies without any synchronous interventions.

The current education practice requires that the role of synchronous coaching is further tested as forms of collaborative learning are used. In the next experiment the role of synchronous coaching in a collaborative learning environment will be investigated. In contrast to the first two studies on plenary teaching, the coaching of collaborative learning is a multidimensional process and thus requires more subtle and diversified observational schemas. The urgency of coaching teachers for collaborative learning practices is evident however. Also the role of 'soufflage' will be more delicate and decisive. The result of this research project which consists of four studies is the development of a synchronous coaching program. The role of this study is that on the basis of the variables 'personality' and 'learning to teach orientations' the success of the direct intervention can be predicted. If a teacher educator concludes that a trainee teacher has a personality or a learning to teach orientation which doesn't fit the requirements for synchronous coaching, the traditional asynchronous intervention will be used.

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## Appendix 1 “Elicited behaviour indicator per situation”

Remark: The number behind the “C” corresponds to the number of the competence.

- Situation 1: C1.1. communicate effectively through verbal (e.g. volume, tempo, articulation, melody) and non-verbal techniques (e.g. facial expression, appearance, posture).
- Situation 2: C1.4. shows personal involvement and enthusiasm for individual students and groups of students.
- Situation 3: C1.7. corrects undesirable behaviour and rewards desired behaviour.
- Situation 4: C1.8. motivates his action in comprehensible language to students.
- Situation 5: C1.3. promotes effective communication through e.g. listening, summarising and through questions at the level of contents and involvement.
- Situation 6: C2.1. offers a safe environment in which students and teachers treat each other respectfully.
- Situation 7: C2.2. cares for a learning situation in which students can show their own input.
- Situation 8: C2.3. systematically uses the input of students in teaching.
- Situation 9: C2.4. stimulates discussion on norms and values between students.
- Situation 10: C2.5. challenges students to think along with him on their own development- and learning process.
- Situation 11: C2.6. considers cultural, social and emotional differences between students.
- Situation 12: C2.7. takes action where necessary to improve the social climate within the group.
- Situation 13: C2.8. signals and names developmental- and behavioural problems in students and refers further if necessary.
- Situation 14: C4.2. is consequent in applying rules and appointments.
- Situation 15: C4.1. states clearly the content, the form, the structure and the relevance of the (education) activity.
- Situation 16: C4.4. establishes priorities and divides the available time efficiently, both for himself and for the students.
- Situation 17: C4.5. knows how to cope with limited possibilities of the teaching facility and has alternatives for bottlenecks.
- Situation 18: C3.11. deals with actuality and practice in education.
- Situation 19: C6.1. applies relevant conversation skills and techniques (e.g. breaking bad news, giving advice).
- Situation 20: C7.6. is flexible and immune to stress: adapts to changing circumstances and has alternatives.