Precision teaching: does training by educational psychologist have an impact?

Rebecca Sundhu and Michelle Kittles

*aOne Education Limited, Manchester, UK; bReflect Psychology, Manchester, UK

**ABSTRACT**

This study looked at the impact of a precision teaching training programme which was delivered by the authors to primary school staff at a range of training settings. A questionnaire was used to gather information and data were interpreted using thematic analysis. Following training, a questionnaire was sent to all the primary schools that had attended. Of the schools that returned the questionnaires all schools were using precision teaching three to five times a week. Precision teaching was being used to measure progress with a variety of key skills. The impact of the precision teaching training programme is discussed in terms of facilitating factors and barriers to implementation. Implications for future research are also considered.

**KEYWORDS**

Precision teaching; barriers; facilitators; training; educational psychology

**Introduction**

Precision teaching originated in the 1960s in the United States and has been promoted in the United Kingdom by educational psychologists (EPs) since the 1980s (see Muncey & Williams, 1981; Raybould & Solity 1982, 1988). A recent description of the principles and delivery of precision teaching can be found in Roberts and Norwich (2010) and Boys and Lyndon (2008).

Precision teaching is an approach used to monitor the acquisition of basic educational skills. Through regular monitoring of children’s accuracy and fluency, precision teaching enables staff to adjust their teaching and interventions to ensure optimum learning for the child. Precision teaching is therefore a formative approach to assessment. This means that precision teaching looks at the process by which a child learns and is therefore an assessment for learning rather than an assessment of learning.

The precision teaching approach is based on the idea of “mastery” learning, which proposes that individuals need to learn new skills to very high levels of accuracy and fluency in order to achieve mastery, which enables them to maintain these over time and generalise to other contexts (Haring & Eaton, 1978).

A number of recent studies into the impact of precision teaching-based interventions suggest it is an effective means of enabling children to acquire and retain basic curriculum skills (Chiesa & Robertson, 2000; Downer, 2007; Roberts & Hampton, 2008). Downer (2007)
found that following a precision teaching programme for an average of 22 weeks led to infant school children increasing their sight vocabulary by an average of two words a week and junior school children by an average of three words a week. Roberts and Hampton (2008) found that through following a precision teaching programme for six weeks, 16 pupils in a social, emotional and behavioural difficulties (SEBD) provision were able to increase their sight vocabulary from an average of 14 words to an average of 42 words. In the study by Chiesa and Robertson (2000) children increased their ability to complete specific maths calculations from one per minute to 13 per minute after taking part in a 12 week precision teaching programme.

Because of the sound evidence base for the effectiveness of precision teaching and its grounding in psychological theories of learning, the educational psychology team for which the authors worked were keen to promote this approach in schools. The authors therefore designed a precision teaching training package which was delivered through one of the following: (1) a centralised training event that staff from different schools could attend; (2) whole school training; (3) training to small groups of staff within a school. Training was voluntary and schools chose to attend based on interest.

Although the training at the time was very positively received, as demonstrated by evaluations completed on the day, the long-term impact of the training was unclear in terms of whether the precision teaching approach would be taken up by schools and to what degree. The authors wanted to both quality-assure the training beyond its initial delivery and evaluate the long-term impact of their work.

The majority of research into precision teaching focuses on whether the approach is effective in terms of improving children’s skills. However there is a lack of research looking at how precision teaching is implemented in schools following training, and investigating the facilitators and barriers to implementation. Initial research in this area has been carried out by Roberts and Hampton (2008). This study looked at what aspects of practice, when introducing a precision teaching initiative to one school, facilitated its implementation and sustainability over time. From interviews with staff they identified four key facilitators in this context: building on successes; developing supportive groups; involving management; having access to on-going development and support.

The authors were interested in building on this research by investigating how precision teaching was implemented in a range of schools following training and what staff viewed as the facilitators and barriers to implementing the approach in their setting. This is an important area to research as the findings can be used to help design training and support to staff, which increases the likelihood of precision teaching being introduced in schools and continuing to be used over time. Roberts and Hampton (2008) comment that sustainable change in workplace settings requires something in addition to the rational application of a training programme or administration of new information to staff.

With the current research gap in mind the authors developed the following research questions:

(1) What is the impact of school staff accessing training on precision teaching from EPs?
(2) What factors support school staff to implement a precision teaching intervention following training?
(3) What are the barriers to school staff implementing a precision teaching intervention following training?
Method

Design

This is a small-scale study based in an inner-city area of northwest England. The research aimed to assess the impact of a training programme delivered by EPs. The purpose of the research was to inform future practice in terms of how the educational psychology team trained and supported school staff to implement precision teaching approaches in their setting. It was also hoped that the study could contribute to the research bases relating to both precision teaching and the role of educational psychology in supporting organisational change.

A combination of closed and open format questions was used in the questionnaire. Participants were asked closed questions to gather factual data about how the intervention was being implemented. Open questions were used to gather participant views about the impact of the training and the implementation process. The questionnaires therefore provided a combination of qualitative and quantitative data. The questionnaire design was finalised following feedback from a questionnaire which had been trialled with one setting.

Participants

The questionnaires were completed by two special educational needs coordinators (SENCos), a deputy head/SENCo, a head teacher and a Level 3 teaching assistant. Four questionnaires were completed by the lead contacts and one questionnaire was completed by a teaching assistant delivering the intervention. Of the schools who completed the questionnaire, three had received bespoke training for their school and two had sent a staff member to a central training event.

Procedure

In 2012 a questionnaire was sent to the primary schools that attended the precision teaching training which had taken place in the same year. The questionnaire was designed to elicit information about how settings had implemented precision teaching following training. It was initially piloted with one setting. Following information obtained from the pilot, a final version was disseminated to schools.

Initially the questionnaire was sent by email to the lead contact identified within each school. A second round of questionnaires was sent by post to one member who did not respond by email. In total questionnaires were sent to 10 schools and five questionnaires were returned. A response rate of 50% is considered a good response rate for questionnaire completion (Baruch & Holtom, 2008). However the authors acknowledge that this study has a small sample size.

Analysis

The questionnaires were analysed using thematic analysis. Thematic analysis is a method for identifying, analysing and reporting patterns (themes) within qualitative data, which enables the researcher to organise and describe their data set and interpret their data in relation to the research topic (Braun & Clarke, 2006). Initial codes were assigned to the data
and these codes were organised into themes. Both researchers were involved in coding the data in order to increase reliability.

**Results**

All five schools that returned the questionnaire had implemented interventions based upon precision teaching following the training. The two staff members who had attended the central training event had both trained other staff in their school following the training. All five schools had implemented precision teaching interventions for individual pupils. The number of pupils who had accessed individual intervention ranged from four to eight pupils in each school. One school used precision teaching as a small group intervention, incorporating it into phonics sessions. Another school used precision teaching as a whole class intervention for learning maths facts. All schools were using the approach on a continuous basis and were delivering the precision teaching sessions between three and five times a week. The majority of precision teaching was delivered by teaching assistants and in two schools was being delivered by teachers. Precision teaching was used to measure progress with a variety of skills, specifically letter recognition, word recognition, times tables, number bonds, adding and taking away to 10.

Questionnaire respondents were asked to rate the impact of the training on a scale of 1 to 10, with 1 being very low and 10 being very high. The mean score given was 8.9 out of 10.

**Research question 1 (RQ1): What is the impact of school staff accessing training on precision teaching from EPs?**

Thematic analysis of the research data generated the following findings in relation to research question 1 (RQ1). The findings are organised into three categories; impact on pupils, impact on staff and impact at a whole-school level.

**Impact on pupils**

- Pupils’ skills improved
  
  All participants reported improvements in children’s attainments in the skills being targeted that included retention over time. One participant made particular reference to a child with significant difficulties with learning who had struggled to learn basic maths skills despite two years of intervention. The child had successfully learnt and retained number bonds to 10 and 20 and the three times table using the precision teaching approach.

- Affective factors influencing learning
  
  The affective factors were identified by all participants as: improved motivation, increased confidence and greater engagement with the learning process as evidenced by pupils knowing their targets. For example, one participant described that “the children cannot wait to complete it [the precision teaching session] to see if they have improved on yesterday’s lesson.”
**Impact on staff**

- **Staff skills improved**
  Three of the five respondents made reference to staff having increased skills and knowledge as a result of the training. One respondent elaborated on their comments by noting that the staff who had received the training had “a greater understanding of the importance of repeated practice and automaticity in learning.”

- **Affective factors influencing teaching**
  Three respondents asserted that staff confidence improved. One respondent described staff as being more confident that they could achieve results with “hard to reach children with SEN [special educational needs]” through using this approach. One school pointed out that confidence came from staff experiencing success in intervention work. One school reported that staff confidence increased when the benefits on the children’s learning were seen.

**Impact on whole school level**

- **Practice**
  Comments about the impact on the whole school varied between the five schools. One school adopted precision teaching as a whole school approach and also planned a future review. Another school planned to train a small group of teaching assistants so that individual pupils could be identified. One school had adapted the precision teaching approach to use with a whole class to learn maths facts and one school used precision teaching within small groups of two to four pupils as well as identifying eight pupils for one-to-one intervention work. One school made a general comment that precision teaching had improved quality and effectiveness of interventions in school.

- **Policy**
  One school included precision teaching in the continued professional development plan for their teaching assistants.

**Research question 2 (RQ2): What factors support school staff to implement a precision teaching intervention following training?**

Thematic analysis of the research data generated the following findings in relation to research question 2 (RQ2):

- **Seeing positive results quickly**
  Two respondents made reference to the fact that seeing positive results with the children they initially used it with helped their school to implement the precision teaching programme. In one school it was trialled for two children with whom it had clear positive results. Following this initial success staff extended the programme to include other children whom it was thought would benefit. In another school precision teaching was trialled with eight children individually and with two small groups of children.

- **Time to deliver**
  Three respondents made reference to time having an impact on delivery in their questionnaire responses. Being given regular protected time slots in the day dedicated to
precision teaching was seen by the teaching assistant who completed the questionnaire as crucial to enabling her to implement the approach.

- Senior leadership support
  Two respondents noted that senior leadership support was an important factor in implementing precision teaching. Having the support of the head teacher was seen by one respondent as helpful in enabling them to promote the approach amongst staff and develop it as a whole school approach. For another respondent having senior leadership protect slots in their day for delivery of the intervention was viewed as helpful in facilitating delivery.

- Positive staff attitudes
  The willingness of staff to deliver precision teaching based interventions was identified as a key factor in implementation by all the respondents. Positive perceptions of precision teaching as an intervention that was easy to deliver and which could be adapted to use with individual and small groups of pupils were also given as factors which supported implementation.

**Research question 3 (RQ3): What are the barriers to school staff implementing a precision teaching intervention following training?**

Thematic analysis of the research data generated the following findings in relation to research question 3 (RQ3):

- **Time constraints**
  Three respondents made reference to time having an impact on delivery in their questionnaire responses. One respondent who was a SENCo and deputy head noted that their senior leadership and teaching commitments were limiting the time they had available for delivering the intervention. This respondent felt that lots more children would benefit from this as an individual intervention than they were able to deliver it to. They described that, to overcome this, staff in this school had adapted precision teaching approaches to make them suitable for using with groups of children.

- **Trained staff member leaving**
  In one setting the member of staff who had been trained in the approach went on maternity leave. Having only one member of staff trained in the approach was cited as a barrier to implementing precision teaching in this setting because they became unavailable to deliver it.

- **Negative staff attitudes**
  One respondent, a senior manager who attended the centralised training event, noted that teaching assistant staff were reluctant to deliver the precision teaching intervention following dissemination of the training in school by herself.

**Discussion**

**The impact of precision teaching training**

In all five of the schools who returned questionnaires, precision teaching-based interventions were put in place by staff following the training session. The interventions were reported to
have had a positive impact on children’s attainments in their targets skills as well as in their confidence, motivation and engagement in learning their target skills. Training was also reported to have had a positive impact on staff skills and confidence in designing interventions for children with special educational needs (SEN) through raising awareness of the importance of repeated practice and automaticity in learning.

There was evidence that, in some schools, staff were incorporating precision teaching-based interventions into their whole school policy and practice rather than simply using the approach on an ad hoc basis or as an isolated intervention with one child. One school had plans to train more staff in the approach, another had incorporated the approach into the professional development plans of support staff and a third school was making the intervention part of their whole school SEN practice with an end of year review built in. Three schools were adapting the approach to use with small groups and whole classes as well as with individual children.

The first research question this study asked was “What is the impact of school staff accessing training on precision teaching from EPs?” Since not all of the schools who had accessed training responded to the questionnaires, it is not possible to take account of the experiences of all schools that accessed the training when answering this question. Schools who chose not to respond to the questionnaires may have done so because they had not implemented precision teaching, meaning that in these schools the training had no or minimal impact and this needs to be borne in mind when interpreting the results. In the schools that did respond, training had led to precision teaching being implemented in all settings and precision teaching was deemed to have made a positive impact to pupils, school staff and whole school SEN practice.

When considering the positive impact on pupils, it is important to note that the schools in this study did not use control groups of children who were not accessing precision teaching-based interventions as a comparison. This makes it impossible to state that the gains observed were definitely due to precision teaching. However the findings on the positive impact on pupils’ skills and attitudes links to previous research studies which have reported increases in attainment of target skills and improved confidence, motivation and engagement following a precision teaching programme being put in place (Downer, 2007). The focus of this study is also the implementation of precision teaching following training rather than the effectiveness of the approach as an intervention, which makes the lack of control groups less problematic.

Overall this study found that accessing training on precision teaching from EPs led to the approach being implemented in at least five of the 10 settings trained. A positive impact on pupils, staff and whole school practice was reported by those settings. These schools varied in how they implemented the training and at what rate.

**Facilitating factors**

Factors which supported staff to use precision teaching following training were identified as seeing positive results quickly, having the time to deliver the intervention being built into the day, having the support of senior leadership, and positive staff attitudes towards the approach. If the intervention was seen as quick, effective and easy to deliver this helped respondents to continue putting the approach into practice over time. It also encouraged participants to widen their use of the approach by extending it to other pupils and using it in
different contexts. Staff valued the opportunity to trial using precision teaching with one child and achieving positive results before beginning to use it more widely. This has implications for the nature of the training session that staff access and the follow-up support available.

The objective of the package was that by the end of the training session participants would understand the theory of precision teaching and would be able to implement a precision teaching programme with a child. To help achieve this objective the course included plenty of practical activities to ensure trainees had experienced methods for measuring, charting and analysing progress. The approach was presented as a series of specific, concrete steps to follow. Ensuring the intervention was easy to understand and seen as easy to implement was important for increasing the likelihood of it being implemented. The results suggest that it is important that the precision teaching training staff access provides them with the skills to be able to deliver this approach themselves straightaway. Providing follow-up support may also facilitate the approach being implemented, as indicated by Roberts and Hampton (2008). This would ensure that if staff did encounter difficulties using precision teaching or did not see progress being made, they could access support to help overcome these difficulties rather than stop using the approach.

The finding that having the support of senior leadership facilitates use of precision teaching suggests that it is beneficial for senior leadership to access the training as well as staff who will be delivering it. Attending the precision teaching training means that senior leadership are able to take the lead in developing the use of this approach with specific children and also as an intervention approach that forms part of the whole school SEN response. It also means senior leadership are able to recognise the amount of time that staff need to have dedicated to using precision teaching and see the importance of having this time protected and built into staff’s timetable to ensure continuity of delivery.

The findings regarding facilitating factors link to those of Roberts and Hampton (2008). They also found that the involvement of management was identified by staff as a key facilitating factor to using precision teaching in educational settings. Participants in their study saw the involvement of management as important in order to lead and guide practice and ensure the approach was high profile and high priority. In this particular school setting the involvement of senior leadership meant that the approach was timetabled into the school day. This links to the other facilitator identified in the current study, of being given enough time to use the precision teaching approach. Roberts and Hampton (2008) also identified creating, celebrating and sharing small successes as a factor which supported the use of precision teaching. This supports the findings that seeing positive results quickly helped people believe the intervention was worth continuing. This suggests that ensuring staff are comfortable with the charting aspect of precision teaching and use of semi-logarithmic graph paper is particularly important when training because this enables staff to see small steps of progress which encourages them to continue using precision teaching.

Research on organisational change has found that staff empowerment is an important facilitating factor (Fullan, 2003). This links to the current findings that staff having positive perceptions of precision teaching in terms of it being effective and easy to use encouraged them to implement it. It is therefore important that staff leave training on precision teaching feeling positive about the approach and competent to put it into practice straight away. The researchers tried to achieve this during training by including plenty of individual and small group exercises to allow participants to practise using precision teaching and interpreting the information it provides.
Barriers to implementing precision teaching

Barriers which impacted negatively on staff’s ability to implement the approach were identified as time constraints impacting on delivery, a trained staff member leaving and negative attitudes, including reluctance to adopt new practice from certain staff.

These findings suggest it is crucial that enough time is devoted to delivering the intervention and that it is given a high status within the school setting. This is supported by the research by Roberts and Hampton (2008) which found that support from management helped ensure precision teaching was used in school. In some schools members of the senior leadership team were trying to deliver the precision teaching-based interventions themselves because they were the staff member who had accessed the training. This was difficult due to their other work pressures, suggesting it is important that training is accessed by a range of staff including those who may be delivering and overseeing the approach (teaching assistants and teachers) and those who may be leading strategically on the approach (SENCo, deputy head, head teacher, literacy/numeracy coordinator).

It is important that more than one member of staff is trained because otherwise the intervention is vulnerable to staff sickness and staff leaving; furthermore, staff can support one another with implementing a new intervention. Roberts and Hampton (2008) talk about the necessity of having a “critical mass” of staff trained in the approach and who are supportive of change to take the intervention forward and ensure it continues to be delivered. One participant who had attended the centralised training event and then delivered the training to staff who would be able to deliver precision teaching encountered negative attitudes from staff who were reluctant to use precision teaching. It is not clear why these negative attitudes were present in this particular staff group and they may have related to issues particular to that setting. However this participant’s experience made the authors question whether the training may be more effective when staff accessed the full training package directly from EPs rather than the information being disseminated by a colleague who may not be seen as having expertise in this approach.

The barriers and facilitators which were identified by this study were done so in the context of training on precision teaching. However the barriers and facilitators could be viewed in the wider context of difficulties that exist generally for school staff when trying to implement interventions after training. Implementing any intervention following training usually depends on an investment of resources by the school in terms of staff, materials and time and the ongoing motivation of those involved in organising and delivering it. These practical constraints can mean that the impact of even well received training is minimised in practice. These factors need to be considered when designing and delivering training on any intervention-based approach.

Conclusion

This is a small-scale study with a limited sample size which means it is difficult to reliably generalise any findings. The study was also conducted by one educational psychology service in one geographical area. It is acknowledged that different services will have different arrangements for the delivery of precision teaching training which may make this study more, or less, relevant to them. Given these limitations the study should be viewed in the context of other research in the area of precision teaching and the delivery of precision teaching training by EPs.
This study found that accessing precision teaching training had the potential to have a positive impact in schools as reported by teaching staff. All schools who responded to the research questionnaire had started using precision teaching in their school which means the approach was being used by at least five out of the 10 schools that accessed training that academic year. Those schools that were using precision teaching reported a positive impact on children, staff and whole school SEN practice. Factors which facilitated precision teaching being used following training were: seeing positive results quickly, having the time to deliver the intervention being built into the school day, having the support of senior leadership and positive staff attitudes towards the approach. Barriers to precision teaching being used were: time constraints impacting on delivery, a trained staff member leaving and negative attitudes, including reluctance to adopt new practice from certain staff. These findings were supported by other studies looking specifically at precision teaching training delivered by EPs (Roberts & Hampton, 2008) and by research into general organisational change within educational settings (Fullan, 2003).

This research suggests that EPs delivering training on precision teaching is a potentially worthwhile use of time and resources. By identifying facilitators and barriers to implementation this study makes a useful contribution to this field by suggesting ways in which EPs can design their training on precision teaching to improve its impact through increasing the likelihood of it being implemented. The barriers and facilitators identified could also be usefully applied to other intervention based training topics delivered by EPs.

Implications for practice

The following list of recommendations has been compiled following consideration of the identified facilitators and barriers to using precision teaching:

(a) Deliver training to a range of staff. If training is accessed by a range of staff, including those who will be delivering precision teaching, those who will be overseeing the programme and those who will be leading on embedding precision teaching into school practice, it is more likely to be implemented successfully. One school sent a member of senior leadership to a central training event and arranged whole school in-service training (INSET) following this, once they were sure it was something they wanted to use within their school.

(b) Deliver training to more than one member of staff per school. It is suggested that staff who attend a central training event may be in a better position to offer a greater level of impact to their school implementing the precision teaching programme if it is attended by more than one staff member. A team approach would also ensure peer support with implementing a new intervention. In contexts where training is funded directly by schools, incentives such as discounts for a second member of staff attending or reduced rates for group bookings could encourage attendance by more than one staff member.

(c) Offer follow-up consultations. Research suggests staff need to see positive results quickly to encourage them to keep using the approach. Offering a group or individual consultation to address any difficulties they may have encountered may help to prevent staff stopping using the approach if they do not see the results they are expecting straight away.
(d) Address logistical issues during training. The results suggest that planning time for staff to think about how precision teaching would work logistically in their school in terms of time for delivery and planning is an important part of training. Sharing known facilitators and barriers to using precision teaching and asking attendees how they could address these in their setting may also be beneficial. It would be useful to complete an activity in which trainees are asked to explicitly plan the next steps to using precision teaching in their school.

(e) Include practical activities in training. As well as understanding the theory behind precision teaching, participants need to feel confident and competent that they can implement all stages of the approach. Breaking precision teaching down into a series of concrete, specific steps and reinforcing the learning through different teaching mediums is recommended.

**Future research**

As EPs, an important part of quality-assuring their work as trainers is evaluating the impact this training has within school settings. Future research could therefore focus further on how EPs can facilitate staff implementing precision teaching following the training they access. It would be interesting to research the implementation of precision teaching following a training package designed with the facilitators and barriers identified by the current research base in mind.

**References**


