Summary

The findings presented in this research support an argument for providing special schools with both touchscreen and interactive whiteboard technologies. Analysing the data allows conclusions to be drawn about the nature of interaction between pupils and adults that is closely in line with Vygotsky's theory of the zone of proximal development. The data also lead to the conclusion that many pupils with profound and multiple learning difficulties may have what the researcher calls a 'comfort-zone', such that their exploration of a computer display via both a 15" touchscreen and a 60" interactive whiteboard decreases the further away from their favoured touching position that they go.

Interactions between pupils and adults seen in the videos used for this research illustrate a wide range of behaviour by the adults, and the researcher has set out to describe these in detail along with making the videos themselves available on a website so that other interested parties can evaluate them independently, and may be encouraged to feed back to the website leading to investigator triangulation. Rather than using terms such as 'good practice', the research aims to specify what the adult does at key moments, and relate the behaviour to the impact on the pupil. Several examples have been highlighted to demonstrate what the researcher believes to be desirable action by the adult where the pupil is being encouraged to strive for an achievement that is marginally beyond their current ability. Examples include development of language, physical gross motor movement and fine motor movement. These all support Vygotsky's work where he describes the zone of proximal development, and show that this concept can apply to schools working with ICT as much as to any other area of child development. The conclusion drawn here is that the adult working with the pupil must be capable of sensitively assessing the individual pupil's learning needs, and be able to exercise skill in judging when and how to verbally and physically guide the pupil to improve.

In assessing how much each pupil touched each separate quarter of the screen the research has highlighted the tendency for pupils with PMLD to concentrate their active, independent touching in one area of the screen, whether that is at a standard sized desktop computer or the larger scale of an interactive whiteboard. It would seem that a substantial proportion of pupils who are working at the level often described as PMLD may be assumed to have not yet developed the skill of exploring the full display physically, and they focus the majority of their independent touching of the screen in what the researcher refers to as their 'comfort-zone'. There are numerous questions arising from this that call for further research, including whether pupils who are able to fully visually scan the screen continue to work with a comfort-zone in terms of their touching and whether such a phenomenon exists in the wider population of pupils with severe learning difficulties. It also calls for new research to check whether simple changes such as creating more distinct borders between the images presented onscreen improves the ability of the pupil to notice separate areas and perhaps therefore consider making the effort to touch them. Wider ranging research could explore whether this is not only a feature of the pupils' use of ICT, but may affect such things as the presentation of a choice array on a table top. The conclusion within this research though is that a comfort-zone is a genuine feature of the ways teachers should expect pupils with PMLD to work with ICT, and as such it calls for a very deliberate approach to teach these pupils how to interact with the full display before presenting them with more advanced work which may lead to assumptions of failure to learn.

In looking at differences between the use of the touchscreen and the whiteboard, it was noted that the two pupils with significant arm and hand mobility difficulties were more distracted when at the smaller scale desktop computer than when using the whiteboard. Along with the general split in the evidence, that half of the pupils use one type of display more actively than the other, this would support the view that special schools need to consider providing both options for an average mix of pupils with SLD and PMLD. The research also raised the broad issue of how PMLD is defined. Although a specific definition was used here it still allowed the inclusion of several pupils who might be thought to challenge the stereotype of the pupil with PMLD.

The researcher argued that even with what appear to be clear definitions for categories such as PMLD it is not possible to fully establish absolute boundaries. He felt that it is far more important to encourage teachers to undertake very careful assessment of individuals across the whole curriculum, rather than to make generalised assumptions from the evidence of one or two striking areas of development.

It was very clear that there has been virtually no UK research into the use of either touchscreens of interactive whiteboards within special schools, and certainly not for pupils with PMLD. While there has been a growing body of work looking at the use of whiteboards within mainstream schools this lack of interest in what goes on in special schools is both typical and unacceptable. The researcher feels that the government needs to tackle this directly by establishing new schemes that enable staff in special schools to access funds and academic assistance to generate a whole new body of action research that can directly contribute to the lives of people with special needs.