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Assistive technology: effects of training on education assistants' perceptions of themselves as users and facilitators of assistive technology and consequent transfer of skills to the classroom environment

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CHAPTER FOUR

RESULTS

4.1 Introduction

The purpose of this research was to investigate Education Assistants Special Needs' (EASN's) perceptions of themselves as users and facilitators of AT in the classroom and to examine how skills learnt in a training situation might transfer into a classroom setting. The following information details the results of the study including general information about the participants and their perceptions of themselves as users of AT and an examination of their skill level and knowledge over three assessment periods: pre-training, post-training (after the 8 week training period) and at a maintenance period ten weeks after the completion of training (see Figure 3.4).

4.2 Demographic Information

Eighteen Education Assistants Special Needs (EASN) personnel took part in the study, all of whom were female. Ages of participants ranged between 18 years to over 56 years of age. Fourteen (77.8%) participants were over 35 years of age; three (16.7%) were in the 26 to 35 year age range, while only one (5.6%) participant was in the 18-25 year old age range. The work experience of the participants varied greatly, with two participants having less than one year of experience in their role as an EASN. In contrast to this, two participants had more than 16 years experience in this role. The majority of participants (61.1%) had between 2 and 10 years of experience. Table 4.1 and 4.2 illustrate the ages of participants and the number of years of employment in the role of an EASN.

Table 4.1

Age Ranges of Participants

| Age range | Number of Participants | Percentage (%) |
|-----------|------------------------|----------------|
| 18-25 yrs | 1 | 5.6 |
| 26-35 yrs | 3 | 16.7 |
| 36-45 yrs | 7 | 38.9 |
| 46-55 yrs | 6 | 33.3 |
| 56+ yrs | 1 | 5.6 |
| Total | 18 | 100.0 |

Table 4.2

Years of Employment in Education Assistants Special Needs Role

| Years | Number of Participants | Percentage (%) |
|-------|------------------------|----------------|
| 0-1 | 2 | 11.1 |
| 2-5 | 5 | 27.8 |
| 6-10 | 6 | 33.3 |
| 11-15 | 3 | 16.7 |
| 16+ | 2 | 11.1 |
| Total | 18 | 100.0 |

The primary disabilities of students catered for by the EASN varied, with the highest number being those students with an Autism Spectrum Disorder. Table 4.3 illustrates the types of primary disabilities of the students, as identified by the EASN. The identification of the types of disabilities by the EASN was achieved through information received from the teacher, parents and observation of the students, in

addition to access to formal identification reports from experts (such as psychologists). Students may have had other disabilities in addition to the primary disabilities.

Table 4.3

Types of Disabilities of Students

| Disability | Types of Students in each Category | Percentage (%) |
|---------------------------------|------------------------------------|----------------|
| Learning Disability/ Difficulty | 6 | 33.3 |
| Physical | 0 | 0 |
| Intellectual | 2 | 11.1 |
| Autism | 9 | 50 |
| Communication | 0 | 0 |
| Vision/Hearing | 0 | 0 |
| Other | 1(Bi-Polar Disorder) | 5.6 |
| Total | 18 | 100.0 |

Flyers were circulated to all of the EASN at the target schools prior to the commencement of the training, detailing the professional development on offer in the area of Assistive technology. Professional development is designed to increase skills and knowledge of staff in their area of expertise, and in this study is in the form of AT training. Thirteen of the eighteen EASN were requested to attend the professional development on AT by a principal or classroom teacher for the purpose of increasing their knowledge and skills in the area of AT use. Five participants independently requested to attend the professional development as they were

desirous to increase their own learning in the field of AT and were excited to be offered professional development which was targeted to their needs.

Only one of the participants had any prior training in the area of assistive technology, undertaken as part of the requirement of a previous role she held, that of supporting students with very high support needs. The remaining seventeen participants indicated that they had been given no formal instruction in this area. This was unexpected considering that the majority of participants (55.6%) had formal Education Assistant qualifications. The remaining participants had completed either Year 10 at high school (22.2%) or Year 11 and 12 at high school (22.2%). Table 4.4 illustrates the reported educational experience of the participants.

Table 4.4.

Reported Educational Experience of the Education Assistants Special Needs

| Level of Education Completed | Number of Participants | Percentage (%) |
|------------------------------|------------------------|----------------|
| Year 10 | 4 | 22.2 |
| Year 11+12 | 4 | 22.2 |
| Education Assistant Course | 10 | 55.6 |
| Other | 0 | 0 |
| Total | 18 | 100.0 |

In addition to the educational experiences reported by the EASN, a range of other previously attended professional development was also cited, with nine of the participants reporting having attended workshops or seminars on Autism, or Autism related areas, and ten reporting attendance at behaviour management sessions. Other

types of professional development completed included first aid training, reading support and manual handling training.

4.3 EASN's Views of their Effectiveness as Users and Facilitators of Assistive Technology

4.3.1 Introduction.

The EASN were asked to identify their perceptions of themselves as both users and facilitators of AT through indicating whether they felt that their skills and abilities regarding AT were excellent, good, fair, poor or very poor. They were also asked about prior training undertaken and what aspects of AT they would like to learn more about during the training, to assist both themselves and the students with whom they worked. This allowed the researcher to gain a better picture of the EASN's abilities and skills so that training could be tailored appropriately. The initial data collection also allowed for a baseline to be established to determine if the training had an impact upon both skill levels and perceptions of the EASN.

4.3.2 Responses to Initial Questionnaire.

Prior to the commencement of the training the EASN completed a questionnaire which included qualitative questions about training they considered relevant to their needs and the needs of the students with whom they worked, as well as their prior experience and training in the area of assistive technology. A five point Likert-type scale was employed to quantify responses to questions on their perceptions of themselves as users and facilitators of assistive technology. The scale (Appendix 1) required participants to respond to questions asking how they would rate their abilities and perceptions in specified areas. The participants were asked to

rate their level of confidence in regards to using AT in the classroom (Figure 4.1). Of the eighteen participants, none felt that their confidence was very poor or excellent, thus eliminating the extremes. Most indicated that they were fairly confident (44.4%), or had a good level of confidence (38.9%). Three (16.7%) of the participants felt that their confidence in using AT in the classroom was poor.

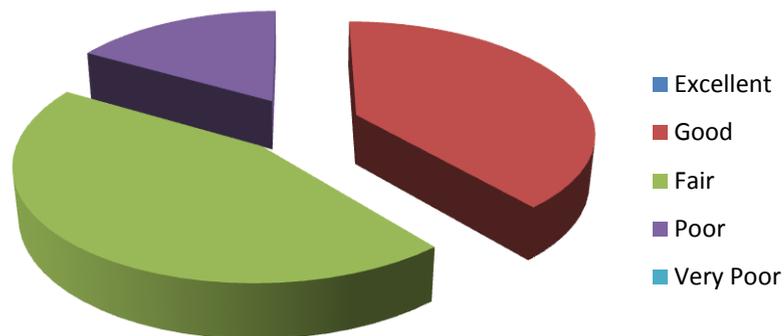


Figure 4.1. Indicated level of confidence in using assistive technology.

The next question asked the participants to rate their current skill level in using AT (Figure 4.2). Once again there were no results for the excellent or very poor categories, indicating that there were no extreme responses. Eight (44.4%) of the participants indicated that their current skill level was good. The remaining participants were equally divided between fair (27.8) and poor (27.8) indications of skill level, which represents over half of the participants. While the majority of the participants therefore had reasonable confidence in their ability to use assistive technology, they did not necessarily feel that they possessed the required skill level to use AT effectively.

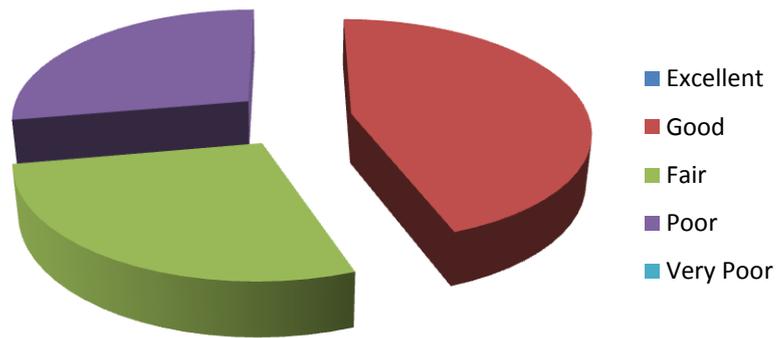


Figure 4.2. Reported level of skills for using assistive technology

Figure 4.3 indicates that participants were less confident about teaching students to use assistive technology, with only six (33.3%) indicating that they had a good level of confidence. Seven (38.9%) participants had a fair level of confidence in teaching others, while five (27.8%) felt that they had a poor level of confidence when teaching others in this area. No-one indicated a very poor or excellent feeling of confidence in this area.

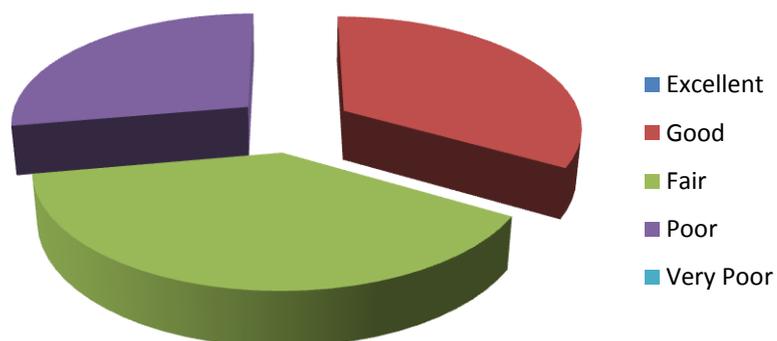


Figure 4.3. Reported confidence in teaching students to use assistive technology

Confidence in their ability to learn more about AT was reported favourably by the EASN (Figure 4.4). Thirteen (72.3%) of the participants stated that their

confidence about their ability to learn more was excellent or good. Three (16.7%) stated that they had a fair level of confidence and two (11.1%) stated that they had a low (poor) level of confidence in learning more about assistive technology. Encouragingly, none of the participants felt that they had a very low level of confidence in learning more about assistive technology.

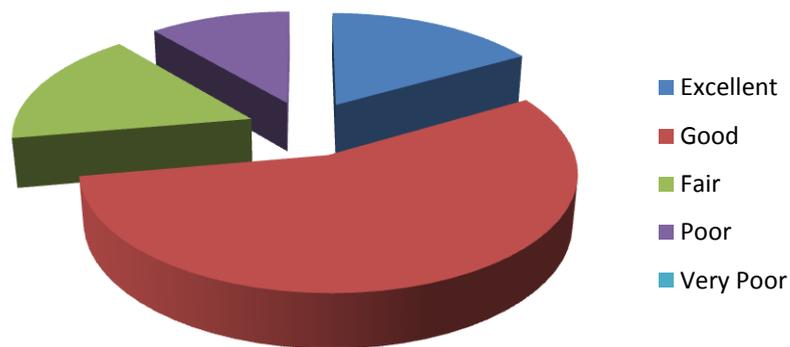


Figure 4.4. Reported confidence to learn more about assistive technology.

Most participants indicated that they had a good (55.6%) or excellent (22.2%) level of confidence in their ability to transfer what they would learn to the classroom environment (Figure 4.5). Two (11.1%) participants felt that they had a fair level of confidence, and two (11.1%) a poor level of confidence in transferring the knowledge and skills learnt. None of the participants indicated that they had a very poor level of confidence in this area.

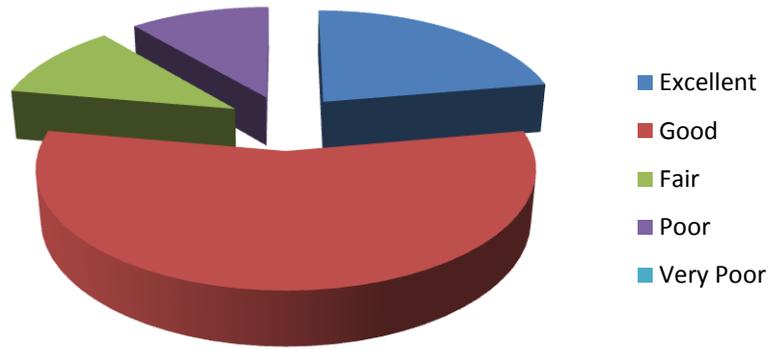


Figure 4.5. Ability to transfer what is learnt in training to the classroom environment.

4.3.3 Training.

In the area of previous training undertaken by the EASN, only one of the participants stated that they had formal training in the area of assistive technology. The remaining participants had received an extensive range of professional development in other areas related to their work. These included behaviour management, courses on specific disability areas (particularly Autism) and first aid training. That the EASN had not received training in AT indicates that it is probably not a priority area for the school or classroom, or even for the EASN themselves, or conversely that the training had not been made available to this cohort. Training in the area of AT is offered by the Department of Education, through the AT team, through companies which sell the assistive technology, or through private training providers. The potential lack of training in this area may contribute to the poor use of AT in a classroom setting.

4.3.4 Relevance of Training.

When asked to detail the training that was relevant to their needs, prior to any testing or training, the EASN were initially hesitant and unsure as to what to suggest. Field notes indicated that the EASN did not fully understand what AT was and that they tended to use the term “computer” to encompass devices, software and computer hardware systems. This observation is supported by their description of what training they would like as it was limited by their understanding of assistive technology. Nine of the participants used generic terms such as ‘programs’ or ‘computer training’ as being relevant to their needs, even though they were asked to clearly specify what type of program or explicit training was required.

When asked to identify the training that they thought may be relevant to the needs of the students with whom they worked, the EASN identified assistance with reading and communication to be important aspects. Once again it is possible they did not specify what type of assistance would be required, or the nature of the technology needed due to a lack of understanding of what constitutes assistive technology.

The EASN were not readily able to identify the needs of a student with a specified disability, as indicated by responses received during skills testing (see Figure 4.6) and during the first training session. Such a deficit was evident across both groups of participants. The skills test question required the participants to read a small vignette and identify the needs of a student and two assistive technologies that would be useful in his case. The results were examined for differences between two groups of participants. Group 1 consisted of EASN who were primarily from

regular school settings and group 2 consisted of EASN who had experience working in Education Support settings, such as Education Support Centres and Schools. Group 2 was found to be more likely to identify the AT that may be used with a student, possibly as there was a student with similar disabilities at their school. The failure to clearly identify students' needs, coupled with a poor understanding of what constitutes AT for some of the participants, may reflect the EASN inability to accurately identify the technology and training that was needed to support the students.

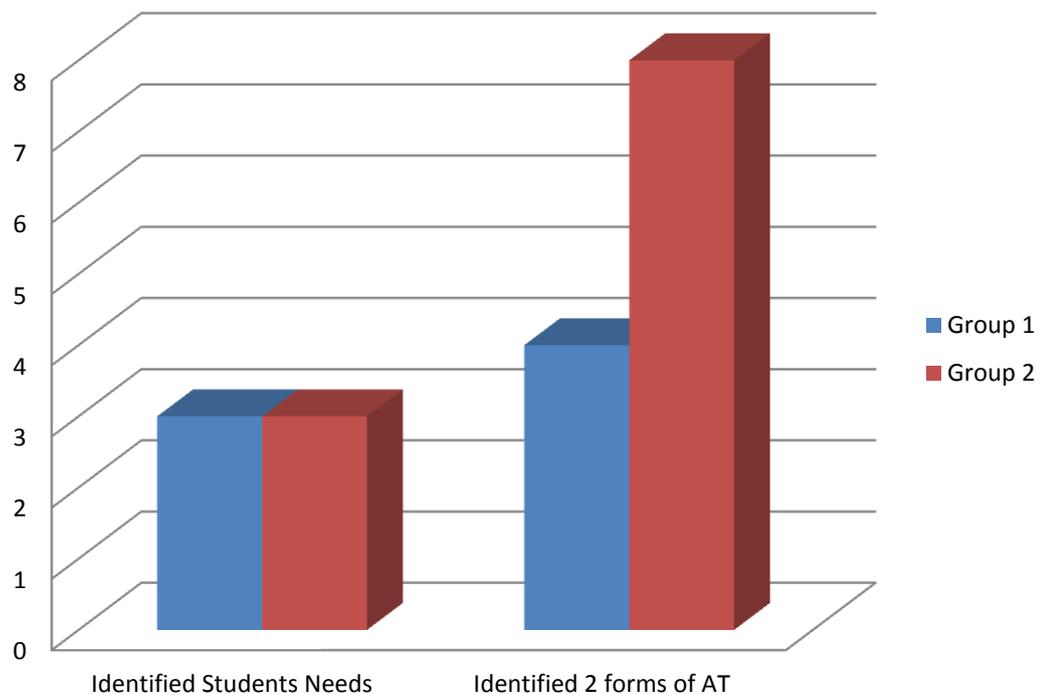


Figure 4.6. EASN's identification of the needs of a student with a special need and the AT to support the student with special needs

4.3.5 Understanding of Assistive Technology.

Often, when responding to questions which asked the participants what their own training needs and the training needs of the students were, there was a general

reference to something that would ‘assist’ or ‘help’ the student, without identifying exactly what this might be. Some of the EASN stated that they were unsure of their own needs in the area of AT. When asked if they had heard of or used various common forms of AT software (e.g. Boardmaker, Clicker 5, PowerPoint), the EASN did not often know what the software was, let alone have any experience with it. Many of the EASN stated that they did not have any previous knowledge of AT specified in the present training program (Figure 4.7). This lack of knowledge indicated that the EASN did not have a thorough understanding of the technologies introduced within the study. This result was interesting as participants within group 2 (who had mainly been associated with special schools and centres) who may be assumed to have experienced a wider variety of AT to support students with more severe needs, had a lower level of knowledge of the technologies than did participants from group 1, who were primarily from regular education settings.

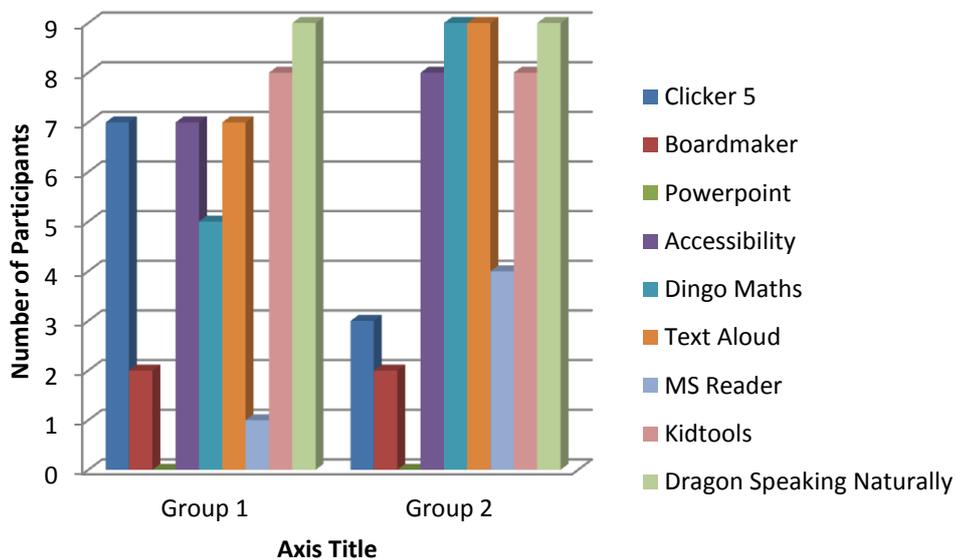


Figure 4.7. Number of participants who had not encountered specific technologies

Figure 4.8 displays the participants from each group who reported having previously used the technologies, either occasionally or extensively, for any purpose. In group 1 there were 11 reports (out of a possible 90) of use of various assistive technologies, while in group 2, there were 13 reports (out of a possible 90). This indicates a low level of use of AT prior to the training across both groups.

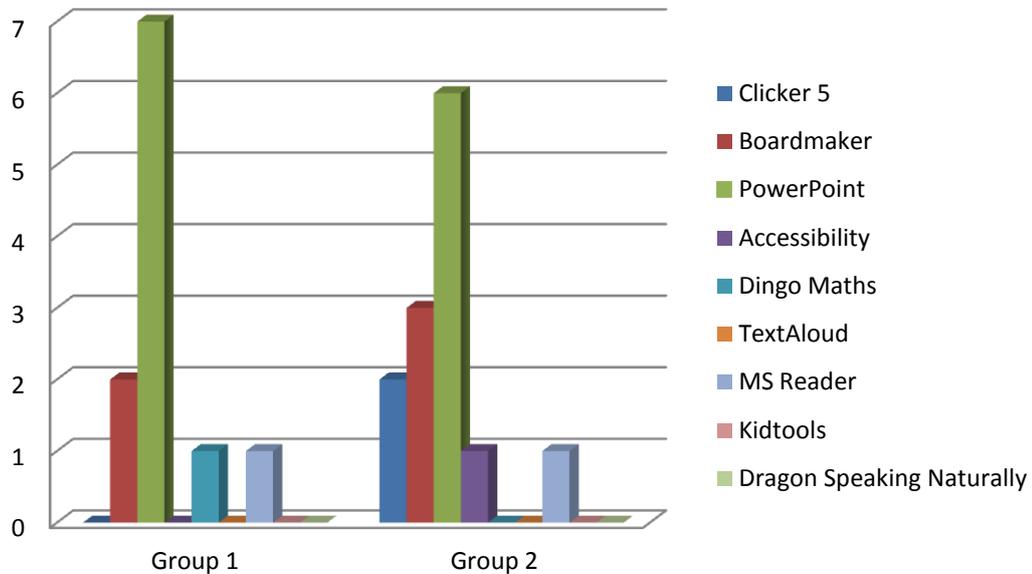


Figure 4.8. Reported use of technology prior to training.

4.3.6 Notes from the Field.

Field notes taken during the initial testing phase of the research support the statistical analysis by indicating that the EASN were unfamiliar with the terminology of ‘assistive technology’. They often used the term ‘computer’ when discussing assistive technology. The EASN were unaware that there was a difference between low-tech and high-tech assistive technology, and that items they may have been using for an extended period of time were considered to be AT (e.g. pencil grips, slant-boards). This lack of awareness became evident during the testing phase and

the first day of training. Once the EASN had established an understanding of what constitutes AT they were more easily able to identify it.

The EASN were originally very unsure of themselves during the initial phase of the testing and claimed to feel ‘stupid’ and that they ‘didn’t know anything’. This was especially obvious among those participants who indicated a poor or fair level of confidence on the initial Likert-type scale questionnaire. At the same time, most of the participants expressed a keenness to learn more about AT and the application of such technology in the classroom.

During the initial testing, a number of the EASN confided in the researcher. They shared feelings and thoughts regarding many issues that they felt strongly about in their classrooms. In particular, concerns were raised about the inability of the EASN to discuss issues or make suggestions to the classroom teacher, powerlessness in regards to implementing what they would be learning, and the differences in resourcing associated with different schools. This was surprising as the EASN had only recently met the researcher and were not yet certain of the researcher’s affiliations.

When observing the participants prior to the training, the structure of the classrooms was also seen to be quite varied. One of the participants, for example, worked in a small community school setting, and was given a lot of freedom to implement ideas. This was evidenced when she was able to change the schedule of activities for the student with autism, with whom she was working, without teacher approval. While observing another class (this one larger and more formal), the

researcher noted that the EASN was required to abide by a strict sequence and structure set by the teacher.

4.3.7 Summary.

The EASN indicated, during initial testing and questionnaire responses, that they felt reasonably confident about learning more about AT and transferring this into the classroom setting. They felt less confident, however, about their own skill level, their ability to use AT and of themselves as facilitators of assistive technology. The EASN had little previous exposure to the understanding of assistive technologies and were unsure of what this entailed. None of the participants indicated that they had excellent levels of confidence or skills in the area of AT use.

4.4 The Impact of Training on Perceptions of Personal Competence and Confidence

4.4.1 Introduction.

In order to determine the impact of the training on the EASN's perceptions of personal competence and confidence and skill level, it was necessary to assess these impacts in a variety of ways, so that cross-checking amongst the data could occur and a coherent picture built of the EASN's perceptions. The EASN were required to complete a questionnaire on three separate occasions (prior to training, after completion of training and after a 10 week maintenance period), complete skills testing on three occasions (prior to training, after completion of training and after a 10 week maintenance period), and were asked to voluntarily participate in a small focus group on two occasions (after completion of training and after a 10 week maintenance period). The Wilcoxon signed-rank test was chosen to determine

differences in skill level prior to the training and at the completion of the training and to examine participants' Likert-type responses regarding their own feelings of competency and skill level. Quantitative data is used to support and embellish qualitative responses gathered from participants during focus groups, and through questionnaire responses.

4.4.2 Wilcoxon Signed-Rank Test Analysis.

A Wilcoxon signed-rank test of the quantitative data was chosen to undertake a repeated measures test. The Wilcoxon signed-rank test assists in determining if there has been a change in participants' skills and responses to indicators (i.e. questionnaire Likert-type scale) over three identical testing phases: pre-test to post-test; pre-test to maintenance test; and post test to maintenance test, that is not due to chance alone. The Wilcoxon signed-rank test is a non-parametric measure utilised when the population cannot be assumed to have a normal distribution, as was the case for the data under investigation.

4.4.2.1 Pre-Training to Post-Training.

4.4.2.1.1 Pre-post questionnaire responses.

Prior to undertaking any training, the EASN were asked to complete a questionnaire which contained a combination of Likert-type responses regarding their skill and confidence levels and written responses regarding their needs in relation to assistive technology. This was followed by eight weeks of training in the area of assistive technology. At the completion of the training, the EASN were again asked to complete another questionnaire which comprised of a combination of Likert-type responses, identical to the initial questionnaire, and written responses in

regards to the training undertaken. Table 4.5 describes the results of the Likert-type responses.

Table 4.5

Questionnaire Responses of Participants Prior to Training and After Training

| | N | Pre-training Median | Post-training Median | Z (Wilcoxon) | p |
|----------------------------------------------------------|----|------------------------|-------------------------|-----------------|-------|
| Confidence for using assistive technology | 16 | 3.00 | 4.00 | -3.035 | .002* |
| Skills in using assistive technology | 16 | 3.00 | 4.00 | -2.658 | .008* |
| Confidence teaching students to use assistive technology | 16 | 3.00 | 4.00 | -2.972 | .003* |
| Confidence for learning more about assistive technology | 16 | 4.00 | 4.00 | -1.933 | .053 |
| Ability to transfer to classroom | 16 | 4.00 | 4.00 | -.577 | .564 |

*indicates significance at the $p < .05$ level

The participants indicated a significant ($Z = -3.035$, $p = .002$) increase in their confidence with using AT from the initial testing to the completion of the training. Median response at initial questionnaire was 3.00 and at post questionnaire was 4.00, indicating an increasing number of participants reported a higher level of confidence. This result was determined based on 16, rather than 18 matched pairs, due to missing data in two cases.

The reported skill level of the participants also increased significantly ($Z = -2.658$, $p = .008$) after the training. Median response prior to the training was 3.00, and after the training was 4.00, suggesting that there was an increase in participants' perceptions of their skill levels. Once again 16 matched pairs were used to calculate the difference. Feeling prepared to teach students to use AT also exhibited a significant increase for the EASN ($Z = -2.972$, $p = .003$). The median increased from 3.00 to 4.00 from the initial questionnaire responses to the post training responses.

There were, however, no significant differences in participants' perception of their confidence in learning more about AT ($Z = -1.933$, $p = .053$) or in their perceived ability to transfer what they had learnt to a classroom setting ($Z = -.577$, $p = .564$). The median in both cases was 4.00 during both initial and post questionnaire responses. This indicates that the participants already felt that their level of confidence in these areas was good, and therefore there was little change after the training.

4.4.2.1.2 Pre-post skills test.

Participants were also required to complete a skills test prior to the training and at the completion of the training. The skills test comprised of items in the areas of foundational skills, planning skills, assessment skills, practice and collaboration (qualitative only), knowledge of assistive technology, and ability to use selected assistive technologies. The selected ATs were determined with the assistance of the Department of Education's Assistive Technology Team, and were identified as being

those most likely to be used by participants. Table 4.6 describes the results of the skills test in each of the areas prior to training and post-training.

Table 4.6

Measured skill level of participants prior to training and after training

| Skill Type | N | Pre-training Median | Post-training Median | Max. Possible | Z (Wilcoxon) | P |
|--------------------------------------------|----|---------------------|----------------------|---------------|--------------|-------|
| Foundational | 18 | 15.00 | 17.00 | 18.00 | -3.315 | .001* |
| Planning | 18 | 6.00 | 8.00 | 9.00 | -3.067 | .002* |
| Assessment | 18 | 2.00 | 3.00 | 3.00 | -1.000 | .317 |
| Knowledge of specific assistive technology | 18 | 14.00 | 20.5 | 36.00 | -3.751 | .000* |
| Use of assistive technologies | 18 | 14.00 | 19.00 | 28.00 | -3.524 | .000* |

*indicates significant at the $p < .05$ level.

The classification of foundational skills comprised six items. The items consisted of basic skills such as turning on/off and logging in to a computer and identifying parts of computers, inserting CD-ROMs and running programs, creating and saving documents, accessing help functions and websites, modifying settings on a computer to cater for individual differences and closing programs and logging off the computer. These were combined to give a total pre and post result for that classification. There was found to be a significant difference ($Z = -3.315$, $p = .001$) in the foundational skills of participants from the pre-testing to the completion of the

training. The median increased from 15.00 to 17.00 over this period as a result of the training in these skills.

There were three items in the planning category. The items consisted of identifying specific features of assistive technology, matching technology to student needs and providing contingencies in case of failure of technology. There was a significant difference between the pre and post skills test for participants in the area of planning ($Z = -3.067$, $p = .002$). The median increased from 6.00 to 8.00 indicating that the EASN were better able to identify and match technology as a result of the training.

The assessment category contained only one quantitative item where participants were asked to identify methods to determine whether or not AT was assisting a student. There was no significant difference ($Z = -1.000$, $p = .317$) on this item from pre-testing to post-testing, although there was a median change from 2.00 to 3.00.

A further item asked participants to respond verbally in regards to how they would monitor the use of assistive technology, examine solutions to problems, and identify people involved in making modifications. Participants often gave one word answers (or a series of one word answers) to these questions, or used short phrases in response. In order to display this data a table format has been used, as it provides a succinct overview of the scope of responses. Responses that were duplicated have not been included. Table 4.7 provides examples of responses to these questions that illustrate an increased number and depth of responses from participants at the post-

testing point, which reflects the impact of the training. Responses for changes pre-maintenance testing can be found in Table 4.11 and post-maintenance testing in Table 4.15.

Table 4.7

Examples of responses on assessment of assistive technology – pre-post testing

| | Pre-testing | Post-Testing |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Monitoring</p> <p><i>(How would you monitor the use of assistive technology in the classroom?)</i></p> | <ul style="list-style-type: none"> • Recording/Recording sheets to track day to day • Sitting with them • Improve on their work/see improvement • What fits in with the teachers daily routine • Use anecdotal notes/write it down | <ul style="list-style-type: none"> • Records-times, dates • Anecdotal/observational records • Sit next to them. See benefit • GPAT, running records • Checklists, rating scales • chart/tally • Quality, compliance, overuse-overreliance • Video • Ask the child |
| <p>Solutions to problems</p> <p><i>(How would you identify changes or modifications to the assistive technology that may be required for a student with a special need?)</i></p> | <ul style="list-style-type: none"> • Progress or regression/frustrated or seeing no benefit. • Not completing the task • Observe • If it wasn't helping/When not meeting needs • Writing notes • If too difficult to use or access, not fitting (growth) | <ul style="list-style-type: none"> • Progress of student • If the child is not completing work • Outcomes, social and academic/ If the objective is not being met • If child couldn't do it • Behaviour of the student • Whether they liked doing it • If student's independence if hindered • If student struggling, not progressing or bored |
| <p>Identifying who is involved in making modifications</p> <p><i>(Who would be involved in making changes to the assistive technology used by the student with)</i></p> | <ul style="list-style-type: none"> • Therapists (Occupational , Speech and Language, Physical) • Teacher • Education Assistant • Parents • Assistant Principal | <ul style="list-style-type: none"> • Teacher • Education Assistants • Parents/ carers • Principal (admin)/co-ordinator, Learning Support Coordinator • Student |

| | Pre-testing | Post-Testing |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Monitoring <i>(How would you monitor the use of assistive technology in the classroom?)</i> | <ul style="list-style-type: none"> Recording/Recording sheets to track day to day Sitting with them Improve on their work/see improvement What fits in with the teachers daily routine Use anecdotal notes/write it down | <ul style="list-style-type: none"> Records-times, dates Anecdotal/observational records Sit next to them. See benefit GPAT, running records Checklists, rating scales chart/tally Quality, compliance, overuse-overreliance Video Ask the child |
| Solutions to problems <i>(How would you identify changes or modifications to the assistive technology that may be required for a student with a special need?)</i> <i>special needs?)</i> | <ul style="list-style-type: none"> Progress or regression/frustrated or seeing no benefit. Not completing the task Observe If it wasn't helping/When not meeting needs Writing notes If too difficult to use or access, not fitting (growth) | <ul style="list-style-type: none"> Progress of student If the child is not completing work Outcomes, social and academic/ If the objective is not being met If child couldn't do it Behaviour of the student Whether they liked doing it If student's independence if hindered If student struggling, not progressing or bored Therapists Tech person Everybody- key stakeholders |

Qualitative data were collected in the area of practice and collaboration. The EASN were questioned as to who they would work with in order to ensure the AT was appropriate for the student/s, who would be involved with implementing AT in the classroom and if it was their role to instruct others in the use of assistive technology. Once again, participants often gave one or two word answers or used short phrases in response. Responses that were duplicated have not been included. Table 4.8 provides examples of responses to these questions illustrating an increased

awareness of the collaboration required to ensure that AT is appropriate and implemented in the best manner possible. Responses for changes pre-maintenance testing can be found in Table 4.12 and post-maintenance testing in Table 4.16.

Table 4.8

Examples of responses to questions on practice and collaboration – pre-post testing

| | Pre-testing | Post-Testing |
|---------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Appropriateness <i>(Who would you work with in order to ensure that the assistive technology was appropriate for the student?)</i> | <ul style="list-style-type: none"> • Teacher • Specialists, Speech Therapist, Occupational Therapist • Outside person • Parents • Visiting teacher • Principal, deputy • Student • Me • Colleagues, co-workers | <ul style="list-style-type: none"> • Student • Specialists, speech, Occupational Therapist • Teacher • Admin, principal • Assistive tech person, Visiting teacher • Primary Behaviour Centres • Parent • Education Assistant • Associates, other Education Assistants • Nurse • Rocky Bay (therapy provider) • Caregiver • Disability experts |
| Implementation <i>(Who would be involved with implementing the use of assistive technology in the classroom?)</i> | <ul style="list-style-type: none"> • Colleagues, Other Education Assistants, • Teacher • Principal, deputy • Students • Myself • Specialists, speech, OTs, physio. • Parents | <ul style="list-style-type: none"> • Teacher • Education Assistants • Parent/family • Other kids in the class • Therapists, speech, occupational, physio. • Other Education Assistants • Student • Any other teachers (relief) • Administrators • Specialised trainer • Nurse • Rocky Bay (Therapist provider) |

| | Pre-testing | Post-Testing |
|-------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Instructing Others <i>(Is it your role to instruct others in the use of the assistive technology? Why/ Why not?)</i> | <ul style="list-style-type: none"> • No. Not trained yet. • Personally yes, but depends on teacher • If asked to instruct other EAs I would do it. • Yes (in a way) to help • No- because EAs get advice and guidance from specialists. Not unless requested. • Not at this school, but have before • Yes, as long as competent and trained, if confident • Yes, because we are level 3 • No- have to come from others unless trained • Yes, If asked. • Should come from teacher. | <ul style="list-style-type: none"> • If I had more knowledge then yes • Yes, to another Education Assistant • Yes- with parents – to help the child • Personally not confident – yes if competent • No, cause I'm just an assistant. Possibly if trained and asked by teacher or principal • It is if they are not aware of it, yes • Yes, if you know a program • Yes, need to share and help each other • Yes, if we have been given OK to • Yeah, because there is no point only one person knowing • Yes, if you feel confident or had training • Need OK from the teacher • Yes, Education Assistants are level 3, should be able to • Yes, if I know something they don't • No, it wouldn't go down well. Rather suggest the program |

A number of specific assistive technologies commonly used in regular settings were identified through contact with the Assistive Technology Team at the Centre for Inclusive Schooling and experience of the researcher. Participants were given the name of the technology and asked to indicate whether they had heard of the technology, not heard of the technology, used it occasionally or used it extensively. These technologies included Clicker 5 (Crick Software, 2010), Boardmaker (Mayer-Johnson, 2010), Microsoft PowerPoint, and Microsoft Reader.

As the EASN had exposure to each of these technologies throughout the training it was found that there was a significant change after training in the EASN's identification of knowledge of, and use of, the technologies ($Z = -3.751$, $p < 0.001$).

The functional and potential use of a number of assistive technologies was examined by asking the EASN to perform certain functions and scoring their ability to do so. These assistive technologies were similar to those the EASN had been asked to identify in the previous section (i.e. Clicker 5, Boardmaker, and PowerPoint). The EASN's ability to use the technology increased significantly after training ($Z = -3.524$, $p = .001$). The median changed from 14.00 to 19.00. This indicated that the EASN were more effective in using the technology after the training.

4.4.2.2. Pre-training to Maintenance.

4.4.2.2.1 Pre – Maintenance questionnaire responses.

To determine the overall change in perception of the EASN, responses from participants prior to the training and after a 10 week maintenance period were examined for change. A Wilcoxon signed-rank test was used to determine if there was a change (positive or negative) in the participants' perceptions of their skills and confidence for using AT (Table 4.9).

Over the course of the study, participants showed a significant increase in their overall confidence with using AT ($Z = -2.721$, $p = .007$). Complete data were available (18 cases) for all initial and maintenance questionnaire responses. Median response at initial questionnaire was 3.00 and at maintenance questionnaire was 4.00.

This finding is consistent with the increase in confidence for using AT that was indicated in the pre-post testing.

Table 4.9

Questionnaire Responses from Participants Prior to Training and After a Ten-Week Maintenance Period.

| | N | Pre-training Median | Maintenance Median | Z (Wilcoxon) | P |
|----------------------------------------------------------|----|------------------------|-----------------------|-----------------|-------|
| Confidence for using assistive technology | 18 | 3.00 | 4.00 | -2.721 | .007* |
| Skills in using assistive technology | 18 | 3.00 | 4.00 | -2.437 | .015* |
| Confidence teaching students to use assistive technology | 18 | 3.00 | 4.00 | -3.082 | .002* |
| Confidence for learning more about assistive technology | 18 | 4.00 | 4.00 | -2.309 | .021* |
| Ability to transfer to classroom | 18 | 4.00 | 4.00 | -1.000 | .317 |

*indicates significance at the $p < .05$ level

The participants felt that their skill level had increased significantly ($Z = -2.437$, $p = .015$) over the period of the study. The median response for the initial questionnaire was 3.00 and the maintenance questionnaire was 4.00. This increase in skill level may be attributed to the content that was taught. Both confidence for teaching students to use AT ($Z = -3.082$, $p = .002$) and learning more about AT ($Z = -$

2.309, $p = .021$) increased significantly over the study. Confidence for teaching students yielded a median response of 3.00 for the initial questionnaire and 4.00 for the maintenance questionnaire. Confidence for learning more about AT yielded a median of 4.00 for both initial and maintenance questionnaires, with the difference indicated in changes for individual participants.

The only item that did not reach significance was the ability to transfer the knowledge learnt to the classroom ($Z = -1.000$, $p = .317$). The median score was high for this item, being 4.00 for both the initial and maintenance questionnaire. There was little difference between participants on this item from initial testing to maintenance testing. This is consistent with the difference between pre and post testing.

4.4.2.2.2 Pre- maintenance skills test.

Table 4.10 illustrates the results of the skills test taken by the participants before training and at the maintenance point. The participants were asked to perform tasks to give a final overview of their skills and knowledge of assistive technology.

The foundational skills of the participants, which includes turning on/off and logging in to a computer and identifying parts of computers, inserting CD-ROMs and running programs, creating and saving documents, accessing help functions and websites, modifying settings on a computer to cater for individual differences and closing programs and logging off the computer, were found to have increased significantly ($Z = -3.783$, $p = .000$) from testing prior to the training to the end of the ten-week maintenance period. There is an increase from the initial testing period to

the post testing period ($Z = -3.315$, $p = .001$). This indicates that the participants' foundational skills are continuing to improve even after the training has concluded.

Table 4.10

Measured Skill Level of Participants Prior to Training and After a Ten-Week Maintenance Period.

| Skill Type | N | Pre-training Median | Maintenance Median | Max. Possible | Z (Wilcoxon) | P |
|--------------------------------------------|----|---------------------|--------------------|---------------|--------------|-------|
| Foundational | 18 | 15.00 | 16.50 | 18.00 | -3.783 | .000* |
| Planning | 18 | 6.00 | 8.00 | 9.00 | -3.369 | .001* |
| Assessment | 18 | 2.00 | 3.00 | 3.00 | -3.000 | .003* |
| Knowledge of specific assistive technology | 18 | 14.00 | 20.00 | 36.00 | -3.709 | .000* |
| Use of assistive technologies | 17 | 14.00 | 20.00 | 28.00 | -3.555 | .000* |

*indicates significance at the $p < .05$ level

The planning skills of the EASN have also significantly changed from testing before the training to the maintenance testing ($Z = -3.369$, $p = .001$). The planning skills involved the participants in identifying features of AT that make it useful for students with disabilities. It also contained items that related to matching of technology with particular needs. The difference continued to increase after the

training had concluded as evidenced by the change in difference from pre-post testing as compared to pre-maintenance testing.

In the area of assessment, the participants were required to demonstrate that they could determine whether a piece of technology was assisting a student with special needs. There was no significant difference on this item during the pre-post testing, however, in the pre-maintenance testing there was significant change ($Z = -3.000$, $p = .003$), indicating that the EASN have continued to consider the needs of students and how these would be assessed. Within the area of assessment, the participants were also asked to describe how they monitor the use of assistive technology, what they would do if the technology did not work, and to identify people who would be involved in making changes to the assistive technology. Examples of their responses during the pre and maintenance skills tests are contained in Table 4.11. Participants often gave one word answers (or a series of one word answers) to these questions. Responses that were duplicated have not been included. These responses indicated a heightened awareness of the methods available to the EASN to monitor the effectiveness of the AT use in the classroom. There was not only an increase in the number of responses, but also in the variety and quality.

Table 4.11

Examples of Responses on Assessment of Assistive Technology – Pre-Maintenance Testing

| | Pre-testing | Maintenance-Testing |
|------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| Monitoring <i>(How would you monitor the use of assistive</i> | <ul style="list-style-type: none"> • Recording/Recording sheets to track day to day • Sitting with them • Improve on their work/see | <ul style="list-style-type: none"> • Checklist • Work completion schedule • Anecdotal notes |

| | Pre-testing | Maintenance-Testing |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>technology in the classroom?)</i> | <ul style="list-style-type: none"> improvement • What fits in with the teachers daily routine • Anecdotal notes | <ul style="list-style-type: none"> • Graph • Observation • Comparison of progress • Reporting • Charts • Observation • Photos • Network meetings • Video/camera • Tally sheets |
| <p>Solutions to problems</p> <p><i>(How would you identify changes or modifications to the assistive technology that may be required for a student with a special need?)</i></p> | <ul style="list-style-type: none"> • Progress or regression/frustrated or seeing no benefit. • Not completing the task • Observe • If it wasn't helping/When not meeting needs • Writing notes • If too difficult to use or access, not fitting (growth) | <ul style="list-style-type: none"> • If not working • Child not progressing • Not passing level/stage • Observation • If frustrated - don't want to do it • If not able to complete tasks independently and is struggling • Behaviour-wise, make changes, trial again, involve him/her • Requiring too much support • If they get bored • If it was transferrable • Student telling you • If they found it difficult to use |
| <p>Identifying who is involved in making modifications</p> <p><i>(Who would be involved in making changes to the assistive technology used by the student with special needs?)</i></p> | <ul style="list-style-type: none"> • Therapists (Occupational, Speech, Physical) • Teacher • Education Assistant • Parents • Assistant Principal | <ul style="list-style-type: none"> • Teacher • Education Assistant • Psychologist • Visiting teacher • Deputy • Principal • Parents • Speech Pathologists • Student • Therapists • Computer specialist • All staff involved |

Practice and collaboration were examined through the responses of the EASN regarding with whom they would collaborate when planning for AT use, who would be responsible for the implementation of AT and who would be responsible for instructing others in the use of assistive technology. Examples of the responses to these questions for both the pre- testing and maintenance testing periods are presented in Table 4.12. Participants provided brief responses in the first two areas, with slightly more information provided for the last area. Responses that were duplicated have not been included. The responses to the aspects of practice and collaboration indicated that the EASN were more aware of who would be involved in determining AT allocation and modification and that their own role is important. There were some further positive responses when the EASN were asked who would be responsible for training staff and other people involved in the student’s education in the use of assistive technology, with many replying that they themselves were.

Table 4.12

Examples of Responses to Questions on Practice and Collaboration – Pre-Maintenance Testing

| | Pre-testing | Maintenance-Testing |
|---------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Appropriateness <i>(Who would you work with in order to ensure that the assistive technology was appropriate for the student?)</i> | <ul style="list-style-type: none"> • Teacher • Specialists, Speech Therapist, Occupational Therapist • Outside person • Parents • Visiting teacher, • Principal, deputy • Student • Me • Colleagues, co-workers | <ul style="list-style-type: none"> • Therapists, relevant specialist • Teachers • Parents • Occupational Therapist • Education Assistant • All key stakeholders • Principal • Learning Support Coordinator • Psychologist • Centre for Inclusive Schooling |

| | Pre-testing | Maintenance-Testing |
|------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | <ul style="list-style-type: none"> • Doctor • Autism association • Admin |
| <p>Implementation</p> <p><i>(Who would be involved with implementing the use of assistive technology in the classroom?)</i></p> | <ul style="list-style-type: none"> • Colleagues, Other Education Assistants • Teacher • Principal, deputy • Students • Myself • Specialists, speech, Occupational, Physical • Parents | <ul style="list-style-type: none"> • EAs • Teachers • Therapists, Speech, Occupational, Physical • Student • Parents • All key stakeholders • Outside agency • Classroom team • Administration |
| <p>Instructing Others</p> <p><i>(Is it your role to instruct others in the use of the assistive technology? Why/ Why not?)</i></p> | <ul style="list-style-type: none"> • No. Not trained yet • Personally yes, but depends on teacher • If asked to instruct other Education Assistants I would do it • Yes (in a way) to help • No- because Education Assistants get advice and guidance from specialists. Not unless requested • Not at this school, but have before • Yes, as long as competent and trained, if confident • Yes, because we are level 3 • No- have to come from others unless trained • Yes, If asked • Should come from teacher | <ul style="list-style-type: none"> • Depends – if it is welcomed • Can be. I might have knowledge • Yeah, cause I know how to do it • Yes, if you feel confident and know what you are doing • Yes, definitely because working at school it is my duty to assist students and to learn more • Yes, if you have been taught/trained • Yes, we help all the time • If the responsibility is handed to me and if I am proficient • No, because I think it is the teacher’s job Happy to show others if I know how • Yes, because I work with the child and know him • Only another Education Assistant – to help out • Mine probably, cause I am the one using it the most • I don’t see why not, |

| Pre-testing | Maintenance-Testing |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <p>might have something they don't know</p> <ul style="list-style-type: none"> • I would support, encourage and share info. Yes, if I have learnt and done the course |

As displayed in Table 4.10, participants were asked to indicate whether they had heard of a specific technology, not heard of a specific technology, used it occasionally or used it extensively (as chosen by the researcher in collaboration with the Centre of Inclusive Schooling) . These technologies included Clicker 5 (Crick Software, 2010), Boardmaker (Mayer-Johnson, 2010), Microsoft PowerPoint, and Microsoft Reader. There was a significant change from the pre to maintenance phase in the EASN's identification of knowledge of, and use of, the technologies ($Z = -3.709$, $p = .000$). The median response increased over this time from 14.00 to 20.00. This is a large increase and indicated the EASN's increased knowledge of a wide range of AT of which they had previously been unaware.

The EASN were also asked to perform a range of tasks aimed at assessing their ability to use assistive technology. The assistive technologies were similar to those the EASN had been asked to identify in the previous section (i.e. Clicker 5, Boardmaker, and PowerPoint). The EASN's ability to use AT increased significantly between the pre-testing and the maintenance phases ($Z = -3.555$, $p = .000$) and the median response changed from 14.00 to 20.00. This is a large increase in skill level as a result of the training the EASN received over the eight week period. The skill level of the EASN increased from the start of the training and this increase was maintained.

4.4.2.3 Post training to Maintenance.

4.4.2.3.1 Post-maintenance questionnaire responses.

In order to determine whether any improvements/changes were maintained over a period of time, participants were asked to complete a questionnaire approximately ten weeks after the completion of the training. The questionnaire consisted of both quantitative and qualitative response forms. The quantitative component required the participants to indicate their perceptions of themselves in a number of areas. These are the same areas as contained in the pre-testing and post training assessments. Table 4.13 displays the results of the post training and maintenance questionnaire responses. These were examined to determine if there had been a change in participants' perceptions of themselves in the area of AT use, after a reasonable period of time since completing training (10 weeks).

There was no significant difference in regards to participants' feelings of confidence ($Z = -.583, p = .560$) and perceptions of their skills ($Z = -.312, p = .755$) for using AT from the post training to the maintenance phase. The median for both post training and maintenance in each of these areas was already high at 4.00. Similarly the participants' confidence for teaching others how to use AT ($Z = -.556, p = .579$), and for learning more about AT ($Z = -.000, p = 1.000$), were not significantly different. The median remained unchanged at 4.00 for each of these items. These findings indicate that the EASN maintained any changes that had occurred as a result of the training.

Table 4.13

Questionnaire Responses from Participants Post Training and After a Ten-Week Maintenance Period.

| | N | Post-training Median | Maintenance Median | Z (Wilcoxon) | P |
|----------------------------------------------------------|----|-------------------------|-----------------------|-----------------|-------|
| Confidence for using assistive technology | 16 | 4.00 | 4.00 | -.583 | .560 |
| Skills in using assistive technology | 16 | 4.00 | 4.00 | -.312 | .755 |
| Confidence teaching students to use assistive technology | 16 | 4.00 | 4.00 | -.556 | .579 |
| Confidence for learning more about assistive technology | 16 | 4.00 | 4.00 | -.000 | 1.000 |
| Ability to transfer to classroom | 16 | 4.00 | 4.00 | -1.667 | .096 |

*indicates significance at the $p < .05$ level

4.4.2.3.2 Post to maintenance skills test

The EASN completed an identical skills test after the training was completed and at a ten week period following the post-test. These results are reported in the five areas under investigation (Table 4.14).

Table 4.14

Measured Skill Level of Participants' Post Training and After a Ten-Week Maintenance Period.

| Skill Type | N | Post-training Median | Maintenance Median | Max. Possible | Z (Wilcoxon) | P |
|--------------------------------------------|----|----------------------|--------------------|---------------|--------------|------|
| Foundational | 18 | 16.00 | 16.50 | 18.00 | -.758 | .449 |
| Planning | 18 | 8.00 | 8.00 | 9.00 | -.812 | .417 |
| Assessment | 18 | 2.00 | 3.00 | 3.00 | -1.897 | .058 |
| Knowledge of specific assistive technology | 18 | 20.50 | 20.00 | 36.00 | -.359 | .719 |
| Use of assistive technologies | 18 | 19.00 | 20.00 | 28.00 | -1.117 | .264 |

*indicates significance at the $p < .05$ level

There was no significant change in any of the skills of the participants from after the training until the maintenance testing. Foundational skills, consisting of 6 items, had a median at post-testing of 16.00 and at maintenance testing of 16.50 ($Z = -.758$, $p = .449$). Planning skills, with three items, had an unchanged median of 8.00 on both testing occasions ($Z = -.812$, $p = .417$). Assessment, which consisted of only one item, had a median of 2.00 at post-testing and of 3.00 at maintenance testing ($Z = -1.897$, $p = .058$). Participants' knowledge of specific technology had also not changed ($Z = -.359$, $p = .719$). The median values actually decreased marginally for this item, from 20.50 to 20.00. Although there was a slight increase in median

values for participants use of AT (19.00 to 20.00) the change was not significant ($Z = -1.117, p = .264$).

During the skills test, the participants were required to respond to a qualitative question on how they would monitor the use of assistive technology, how they would identify changes that needed to be made and who would be involved in making these. Table 4.15 presents examples of responses. Many of the responses were brief, even one-word answers. Duplicated responses have not been included. The participants were able to provide a greater number of responses during the maintenance testing period, although these were of comparable quality with those given during the post-testing period, suggesting that they had expanded their knowledge base of tools to monitor student progress. The responses at both the post-testing and maintenance phases, for example, included reference to charts, tallies, video, observation and anecdotal records.

Table 4.15

Examples of Responses on Assessment of Assistive Technology – Post Training To Maintenance Testing

| | Post-testing | Maintenance-Testing |
|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Monitoring <i>(How would you monitor the use of assistive technology in the classroom?)</i> | <ul style="list-style-type: none"> • Records-times, dates • Anecdotal records • Observational records • Sit next to them. See benefit • GPAT, running records • Checklists, rating scales • Chart • Tally • Quality, compliance, overuse-overreliance • Video | <ul style="list-style-type: none"> • Checklist • Work completion schedule • Anecdotal notes • Graph • Observation • Comparison of progress • Reporting • Charts • Observation • Photos |

| | Post-testing | Maintenance-Testing |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <ul style="list-style-type: none"> • Ask the child | <ul style="list-style-type: none"> • Network meetings • Video/camera • Tally sheets |
| <p>Solutions to problems</p> <p><i>(How would you identify changes or modifications to the assistive technology that may be required for a student with a special need?)</i></p> | <ul style="list-style-type: none"> • Progress of student • If the child is not completing work • Outcomes, social and academic/ If the objective is not being met • If child couldn't do it. • Behaviour of the student • Whether they liked doing it • If student's independence is hindered • If student struggling, not progressing or bored | <ul style="list-style-type: none"> • If not working • Child not progressing • Not passing level/stage • Observation • If frustrated -don't want to do it • If not able to complete tasks independently and is struggling • Behaviour-wise, make changes, trial again, involve him/her • Requiring too much support • If they get bored • If it was transferrable • Student telling you • If they found it difficult to use |
| <p>Identifying who is involved in making modifications</p> <p><i>(Who would be involved in making changes to the assistive technology used by the student with special needs?)</i></p> | <ul style="list-style-type: none"> • Teacher • Education Assistants • Parents/ carers • Principal (admin)/co-ordinator, Learning Support Coordinator • Student • Therapists • Tech person • Everybody- key stakeholders | <ul style="list-style-type: none"> • Teacher • Education Assistant • Psychologist • Visiting teacher • Deputy • Principal • Parents • Speech Pathologists • Student • Therapists • Computer specialist • All staff involved |

The EASN were asked to provide descriptive information at both the post testing and maintenance phases on who they would work with to ensure the AT was appropriate, who would be involved with implementing the AT and whether or not it

was their role to instruct others in the use of assistive technology. Table 4.16 provides examples of the responses received. The responses from the participants are similar in number and quality for both data collection points. Often one-word responses were given, and duplicated responses are not included.

Table 4.16

Examples of Responses to Questions on Practice and Collaboration – Post Training-Maintenance Testing

| | Post-training | Maintenance-Testing |
|---------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Appropriateness <i>(Who would you work with in order to ensure that the assistive technology was appropriate for the student?)</i> | <ul style="list-style-type: none"> • Student • Specialists - Speech, Occupational, Physical • Teacher • Admin, principal • Assistive tech person • Centre for Inclusive Schooling, Visiting teacher • Primary Behaviour Centre • Parent • Education Assistant • Associates, other Education Assistants • Nurse • Rocky Bay (therapist provider) • Caregiver • Disability experts | <ul style="list-style-type: none"> • Therapists, relevant specialist • Teachers • Parents • Occupational Therapist • Education Assistant • All key stakeholders • Principal • Learning Support Coordinator • Psychologist • Centre for Inclusive Schooling – Visiting Teacher • Doctor • Autism association • Admin |
| Implementation <i>(Who would be involved with implementing the use of assistive technology in the classroom?)</i> | <ul style="list-style-type: none"> • Teacher • Education Assistants • Parent/family • Other kids in the class • Therapists, speech, Occupational, Physical • Other Education Assistants • Student | <ul style="list-style-type: none"> • Education Assistants • Teachers • Therapists relevant specialist • Student • Parents • All key stakeholders • Outside agency • Classroom team • Admin |

| | Post-training | Maintenance-Testing |
|------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <ul style="list-style-type: none"> • Any other teachers (relief) • Admin • Specialised trainer • Nurse • Rocky Bay (therapist provider) | <ul style="list-style-type: none"> • Peers |
| <p>Instructing Others</p> <p><i>(Is it your role to instruct others in the use of the assistive technology? Why/ Why not?)</i></p> | <ul style="list-style-type: none"> • If I had more knowledge then yes • Yes, to another Education Assistant • Yes- with parents – to help the child • Personally not confident – yes if competent • No, cause I'm just an assistant. Possibly if trained and asked by teacher or principal • It is if they are not aware of it, yes • Yes, if you know a program • Yes, need to share and help each other • Yes, if we have been given OK to • Yeah, because there is no point only one person knowing • Yes, if you feel confident or had training • Need OK from the teacher • Yes, Education Assistant are level 3, should be able to • Yes, if I know something they don't • No, it wouldn't go down well. Rather suggest the program | <ul style="list-style-type: none"> • Depends – if it is welcomed • Can be. I might have knowledge • Yeah, cause I know how to do it • Yes, if you feel confident and know what you are doing • Yes, definitely because working at school it is my duty to assist students and to learn more • Yes, if you have been taught/trained • Yes, we help all the time • If the responsibility is handed to me and if I am proficient • No, because I think it is the teacher's job Happy to show others if I know how • Yes, because I work with the child and know him • Only another Education Assistant – to help out • Mine probably, cause I am the one using it the most • I don't see why not, might have something they don't know • I would support, encourage and share info. Yes, if I have learnt and done the course |

4.4.3 Post Training Qualitative Questionnaire Responses.

In addition to determining the EASN's statistical changes in perception of skill and confidence levels using non-parametric statistics, they were also asked to comment qualitatively on these aspects by addressing a number of written response questions (Appendix 3). The responses from the participants were submitted to an NVIVO (QSR International, 2008) database and coded according to key themes in each of the areas addressed in Table 4.17. These themes were identified by examining the data and determining the most frequently reported responses. The questions served as a form of data reduction (Miles & Huberman, 1984).

Table 4.17

Themes Identified in Qualitative Questionnaire Responses

| Questions | Themes |
|----------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Was the training relevant to your needs? If so, how? | <ul style="list-style-type: none"> • Personal impact • Impact on students • Relevancy of low-tech assistive technology |
| Was the training relevant to the students with special needs with whom you work? If so, how? | <ul style="list-style-type: none"> • Use of high-tech assistive technology • Use of low-tech assistive technology • Feelings about the use of assistive technology |
| Have your perceptions of personal competency in the area of assistive technology changed as a result of the training? If so, how? | <ul style="list-style-type: none"> • Knowledge of assistive technology • Confidence to use assistive technology • Motivation to use assistive technology |
| Do you feel prepared to teach a student with a disability to effectively use assistive technology to the fullest extent possible? Why? | <ul style="list-style-type: none"> • Knowledge of resources • Confidence to use assistive technology • Improved skill levels |
| Will the skills covered in the training be used in | <ul style="list-style-type: none"> • High-tech assistive technology |

the classroom in which you are situated? If so, how?

- Low-tech assistive technology
 - Barriers to the use of assistive technology in the classroom
-

The first question asked participants to describe how relevant the training was to their needs. Three main themes emerged from the responses: personal impact on EASN, impact on students, and the relevance of low-tech AT. The EASN strongly indicated that the training was very relevant to their personal needs and that the information was relevant to their individual situations in the classroom. They felt better able to respond to students' needs as a result of the training. One participant stated that "Yes, it was very informative. I feel better equipped to help with a child's needs as a result of this training. This training has opened my eyes to not only high tech but also low and medium tech that we can so often over look. It is great to think there is so much at our finger tips if we are creative. I had completed my cert 4 special needs 2 years ago and this training has been a fantastic extension".

It was also noted that the students were helped by the EASN's increased knowledge and skills, and that this in turn allowed the EASN to function more effectively in the classroom. As one of the participants commented, "I have been able to take away useful ideas to implement from every week. Even when we were learning about visual and hearing impaired there were things that would still be helpful to R". The last theme identified was that of the relevance of the low-tech AT. The participants, in their responses, suggested that the use of low-tech AT would be very beneficial for the students, as well as being very accessible for themselves, as EASN. As one participant stated, "I was surprised at how much can be done with simple or low tech things to assist children and make things easier for them to learn

and do everyday activities”, while another expressed that “knowing that AT doesn't just mean computers and cameras is great. Lots of ideas given for low AT and websites”.

The second question asked participants to state if and how the training was relevant to the students with whom they worked. Most of the EASN felt that the training was beneficial in some way for the students. Those who were unsure of the benefits further commented that they could see how the training may be beneficial for future students with whom they may work. Three themes emerged from the data in regard to the relevancy to students. These were: use of high-tech assistive technology, use of low-tech AT and feelings towards the use of assistive technology.

The participants felt that a number of medium to high AT devices and tools would be of great benefit for the students. Often these were indicated as potential tools for future use. Comments made included that “I thought text to voice would be helpful. Also the useful internet sites for students with physical disabilities is helpful; knowing where to get the resources”, and “it will assist with communication and indicating their needs. E.g., talking devices”. Participants felt that low-tech AT was equally beneficial and many were already incorporating aspects of the use of low-tech AT into their teaching activities: “it has given me the tools to help the child to develop and enhance control and independence with their behaviour monitoring”. Participants commented that they thought the students would feel better about themselves as a result of being able to access activities and that the training was beneficial for both the students and themselves. As noted by one EASN, “Some of the information wasn't relevant to the student I am working with this year, however it

will be extremely helpful in subsequent years. I will have a wealth of ideas and knowledge of some fabulous tools right from the beginning”.

The third question required participants to comment on their perceptions of competency in the area of AT and whether these had changed as a result of the training. Three key themes emerged from the data: Knowledge of assistive technology, confidence to use AT and motivation to use assistive technology. Knowledge of the AT was overwhelmingly cited by the participants as being a key factor in a positive change of perceptions. This knowledge included what AT actually was and its purpose, understanding the range of AT, and knowing what to use to assist a student. In particular, one EASN stated that “I have a lot more knowledge of what is around in the area of assistive technology”, while another suggested that “although I know some resources are useful, I did not realise that so many technologies can be used to enhance and maintain their everyday lifeskills”.

The participants also explicitly stated that an increase in confidence for both using the AT and sourcing appropriate technology was an outcome of the training. Comments such as “Although I'm not a guru, I feel I have the confidence to try certain programs not previously known to me before this training”, and “I am comfortable finding resources” serve to illustrate this point. Some of the participants felt that they were more motivated to use AT as a result of the training: “I feel more motivated and re-energised”. Although within the theme of motivation, one participant also commented that it could be difficult to remain motivated if there were barriers to implementing assistive technology. She stated that “Sometimes I

feel frustrated that it is sometimes difficult to access programs; funding, and time constraints make it hard to stay motivated long term”.

The fourth question asked the EASN if they felt prepared to teach students with disabilities to effectively use AT and to elaborate upon their answers. The themes which emerged from the responses were: knowledge of resources, confidence to use AT and improved skill levels. The EASN felt that their improved knowledge in the area of AT allowed them to appropriately select and use the technology with students. A participant suggested that she felt better equipped to teach students with disabilities to use AT because she “better understands why it is used and also how to use it or find it”. The participants stated that their confidence for assisting the students had also increased, and that they were able to approach unfamiliar technology with confidence. Some of the EASN commented that they would be better prepared to assist students as their own skill level improved, for example, “I feel better prepared but not entirely comfortable. I will be better once I put some of it into action”.

The fifth and final question required participants to discuss whether the skills they had learnt in the training would be used in the classrooms in which they were situated. The themes which were identified were: use of high-tech assistive technology, use of low-tech AT and barriers to the use of AT in the classroom. Many of the participants stated that they were already, or would be agreeable to, use medium to high-tech AT in the classroom. Often mentioned technology included Clicker 5, computer programs, writing support devices and Boardmaker, as illustrated by a comment from one participant, “A lot of technology used in our

classroom is based on computer programs (Smartboard). Symwriter and Boardmaker will be very useful programs”. Many of the participants stated that they were already using a number of low-tech assistive technologies, including reading windows, rulers with handles and pencil grips, and that they would continue to do so - “we are already using reading windows, visual aids on desks and pen grips”. A few of the participants also described potential barriers to the use of assistive technologies in the classroom, namely, the wishes of the classroom teacher and access to the technology. An EASN articulated this thought, “Hopefully so, I just need to know what is available in some way, and whether the teacher would be open to a lot of it. I’m sure they would be if we had the resources or backing from the school”. These views were explored further through a focus group interview.

4.4.4 Post Training Focus Group Interview.

In order to extend previous collected data and to ensure that multiple sources of data were used, participants were asked to voluntarily take part in a small focus group at the completion of the training. Seven of the eighteen EASN elected to participate in the sessions. The focus groups were semi-structured, with participants asked focused questions (Appendix 4) regarding their perceptions of their experiences during the training and how this may have impacted upon them.

Participants were initially asked if they felt prepared to teach students with special needs using AT after receiving the training. The majority of participants stated that they felt more confident in using AT and more aware of what was available to them. One EASN stated “I definitely think I feel more confident and I’m more capable of working with students and teaching them to actually use it”.

The remainder of the participants stated that the lack of access to some of the software that is available in the school, and the time required to use it were barriers to their ability to practice with, and use, assistive technology. They felt that this then impacted on their confidence to use AT with students. As one EASN indicated, however, “the knowledge is always there for us, for another situation”.

The EASN were then asked if the training had an impact on their feelings of efficacy and personal competence for using assistive technology. Unlike the questionnaire responses, this was a difficult question for them to answer and the focus group required re-direction on a number of occasions. Generally the EASN felt that what they learnt had been beneficial to them, but there were few comments on their actual feelings of personal competence. This was referred to obliquely in a number of ways, such as EASN stating that they liked knowing how to use something, and that the training really helped. It may be that it is difficult to verbalise feelings of efficacy.

Similar to the questionnaire responses, all of the participants felt that the training provided could be used in a number of situations and with a number of students. One respondent stated that “I think we could adjust the equipment or whatever we are using for that purpose. So it was quite useful”. Others suggested that the knowledge and skills learnt in the training could be used across a wide range of settings, including regular education settings and education support settings. The teachers’ responses to the EASN’S increased level of knowledge in the area of AT were quite polarised. Some participants stated that their teacher was grateful for the EASN contributing ideas to the classroom, while others felt that their opinions were

not asked for or respected. This is emphasised by the statement that “I get a lot of teachers who think I’ve been doing this for years and there’s no need for you to tell me anything cause I know it all”. EASN who felt that the classroom teacher responded well to their training stated that these teachers “...are quite happy when I give them the ideas. They are quite open to suggestions and things like that”. Teacher attitudes towards EASN in the classroom appeared to have been a factor in the ability of the EASN to utilise the AT in the classroom.

When asked if they had increased the use of AT in the classrooms the EASN were generally able to name at least one form of AT (usually low-tech) that they had utilised after the completion of the training. Where the EASN were unable to name any devices/systems that they had used as a result of the training, they were generally aware that they had increased levels of knowledge which could be used at a later stage. Some of the technology that was being utilised at this stage in the research included pencil grips, rulers with handles, visual supports (COMPIC), shaving cream (for fine motor development), deodorant paint bottles and computer programs (Timez Attack). The EASN suggested that some of the barriers to implementation included time to explore and learn new technologies, lack of budget to purchase expensive AT, and teacher resistance. The EASN suggested that ways to address some of these barriers included sharing of resources with better resourced settings/schools, and by having pre-made devices on hand or offering to make them for the teacher. These barriers were similar to those previously identified by participants during questionnaire responses.

4.4.5 Field Notes.

The observational notes for the post training period suggested that the EASN are eager to apply new skills and knowledge in the classroom. There was some comment on the large amount of information covered in the training sessions, and that it would take some time for them to assimilate the information and determine applicability for individual situations. Most of the EASN had used at least one form of AT in the classroom already, that they had not previously used, and one school group of EASN had put together a 'kit' of AT items that could be used by all members of the school community.

Observation of this school in which three of the EASN were situated revealed that all of the EASN had utilised some of the training in different ways to assist with the students with special needs. One of the EASN was using low-tech aids, such as pen grips, another had set up visual schedule son the computer, while another had implemented behaviour management tools with the student with whom she worked. In another school one classroom was observed where two of the EASN were implementing visual cue cards as reminder systems, and slant boards for two students who would benefit from these. The EASN also showed the researcher around the classroom and commented on what computer applications and programs had been utilised since their training. The EASN demonstrated a sense of 'comfortableness' around AT that was not evident at the beginning of the study, with those who had previously not contributed providing their opinion, and an eagerness to put what they had learnt in place. The EASN were also keen to explore possibilities for the students with whom they worked, and collaboratively discussed ideas to support the needs of the students.

4.4.6 Between Group Differences.

There were two identifiable groups within the participants. One group (n=10) was comprised of EASN who had only worked in regular settings, and the other group (n=8) comprised of EASN who had previously worked in special education settings such as Education Support Centres and Education Support Schools. Participants who worked in the latter settings tended to work with students who had higher levels of need, and generally had greater access to a wider range of assistive technologies. As the number of participants was small, a Kruskal-Wallis nonparametric statistical analysis was undertaken to determine if there were any differences between the two identified groups in the area of confidence and skills. Table 4.18 presents the differences between groups, pre-and post, on the Likert-type scale questionnaire responses.

Table 4.18

Differences between Groups on Pre-Training Questionnaire, Post-Training Questionnaire and Maintenance Questionnaire Likert-type Responses.

| | N | df | χ^2 (Kruskal-Wallis) | P |
|----------------------------------------------------------|----|----|---------------------------|------|
| Pre Training | | | | |
| Confidence for using assistive technology | 18 | 1 | .927 | .336 |
| Skills in using assistive technology | 18 | 1 | .509 | .475 |
| Confidence teaching students to use assistive technology | 18 | 1 | .722 | .395 |
| Confidence for learning more about assistive technology | 18 | 1 | .962 | .327 |
| Usefulness of training for classroom situation | 18 | 1 | .039 | .844 |

| | N | df | χ^2 (Kruskal-Wallis) | P |
|----------------------------------------------------------|----|----|---------------------------|-------|
| Post Training | | | | |
| Confidence for using assistive technology | 16 | 1 | 4.733 | .030* |
| Skills in using assistive technology | 16 | 1 | 5.051 | .025* |
| Confidence teaching students to use assistive technology | 16 | 1 | 1.838 | .175 |
| Confidence for learning more about assistive technology | 16 | 1 | 5.000 | .025* |
| Usefulness of training for classroom situation | 16 | 1 | 2.232 | .135 |
| Ability to transfer to classroom | 16 | 1 | .385 | .535 |
| Maintenance | | | | |
| Confidence for using assistive technology | 14 | 1 | .000 | 1.000 |
| Skills in using assistive technology | 14 | 1 | .567 | .451 |
| Confidence teaching students to use assistive technology | 14 | 1 | .088 | .767 |
| Confidence for learning more about assistive technology | 14 | 1 | .227 | .633 |
| Usefulness of training for classroom situation | 14 | 1 | 1.083 | .298 |
| Ability to transfer to classroom | 14 | 1 | .000 | 1.000 |

*indicates significance at the $p < .05$ level

Few between group differences surfaced. The only significant differences between the groups' perceptions were in the post training data collected. There was a significant difference between the two groups' reporting of their confidence in using AT $\chi^2 (1, N=16) = 4.733, p = .030$. Group 1, those who had not previously worked with children with high support needs, indicated that they had a higher level of confidence than group 2 after the training was completed. This difference

disappeared at maintenance testing. There was also a significant difference between the groups in the post-training phase in the area of reported skills $\chi^2 (1, N=16) = 5.051, p = .025$, and in EASN's confidence in learning more about AT $\chi^2 (1, N=16) = 5.000, p = .025$. There were no significant differences between the groups in any other area of the questionnaire responses.

Table 4.19 describes the results of a Kruskal-Wallis analysis conducted on the data collected from the skills test administered to all participants at the three data collection points: skill level of the two groups prior to training, after training and after the 10 week maintenance period.

Table 4.19

Differences between Groups Skills for Pre-Training, Post-Training and Maintenance.

| | N | df | χ^2 (Kruskal-Wallis) | P |
|----------------------------------|----|----|---------------------------|------|
| Pre Training | | | | |
| Foundational Skills | 18 | 1 | 1.901 | .168 |
| Planning | 18 | 1 | .293 | .588 |
| Assessment | 18 | 1 | 2.100 | .147 |
| Knowledge of Specific Technology | 18 | 1 | .073 | .787 |
| Use of Specific Technology | 17 | 1 | 2.128 | .145 |
| Post Training | | | | |
| Foundational Skills | 18 | 1 | 1.592 | .207 |

| | | | | |
|----------------------------------|----|---|-------|------|
| Planning | 18 | 1 | .055 | .814 |
| Assessment | 18 | 1 | .638 | .425 |
| Knowledge of Specific Technology | 18 | 1 | .018 | .893 |
| Use of Specific Technology | 18 | 1 | 2.892 | .089 |
| Maintenance | | | | |
| Foundational Skills | 18 | 1 | 2.063 | .151 |
| Planning | 18 | 1 | .148 | .701 |
| Assessment | 18 | 1 | .744 | .388 |
| Knowledge of Specific Technology | 18 | 1 | .450 | .502 |
| Use of Specific Technology | 18 | 1 | 1.352 | .245 |

*indicates significance at the $p < .05$ level

Results indicated there were no significant differences between the groups when they were skill tested. This indicates that the groups were similar in their ability to use computers and assistive technology. Although group 2 had greater access to assistive technology, the results do not indicate a difference in skill level between the two groups. The EASN from both groups also reported that they were rarely given opportunities in class to practice or use assistive technologies.

4.4.7 Summary of the Impact of Training.

The training significantly improved the EASN's skills in all of the areas assessed. The participants were able to demonstrate performance of a higher level of skills at both the post-training and maintenance testing. This increased level of skill indicates that the training had a positive effect on the participants. In addition to observable skills, the EASN rated their own confidence for using assistive technology, teaching others to use AT and to learn more about AT as all being

significantly higher ten weeks after the training. There was no significant difference found in the areas of skills or confidence between the post-training and maintenance period. There was also no significant difference found between the two identified groups.

4.5 The Use of AT in the Classroom by Education Assistants Special Needs after Training

4.5.1 Introduction.

In addition to appropriate training to assist the EASN to use and facilitate the use of assistive technology, an equally important consideration is their ability and willingness to transfer this knowledge to the ‘real’ classroom environment. This was examined in a number of ways. Firstly the EASN were asked to rate their ability to transfer the information that they would learn in the training to the classroom situation. They were then asked to rate the usefulness of the training received for their individual situations. The EASN also provided written responses to questions and a representative sample participated in small focus groups. The researcher also visited a number of classrooms in which the EASN were working and observed the participants using a variety of assistive technology. During the training period none of the EASN had exposure to any other training in the area of assistive technology, either face-to-face or online. Other than using AT in the classroom setting, the EASN were not exposed to any other AT apart from that discussed and used during training sessions.

4.5.2 Wilcoxon Signed-Rank Test Analysis of the Questionnaire Responses.

Participants were asked to rate their ability to transfer the information learnt in the training to the classroom. As was seen in previously reported results, the participants rated this item highly on all data collection points, and there was no significant difference between the initial questionnaire, the post-training questionnaire and the maintenance questionnaire responses. These results are represented graphically in Figure 4.9.

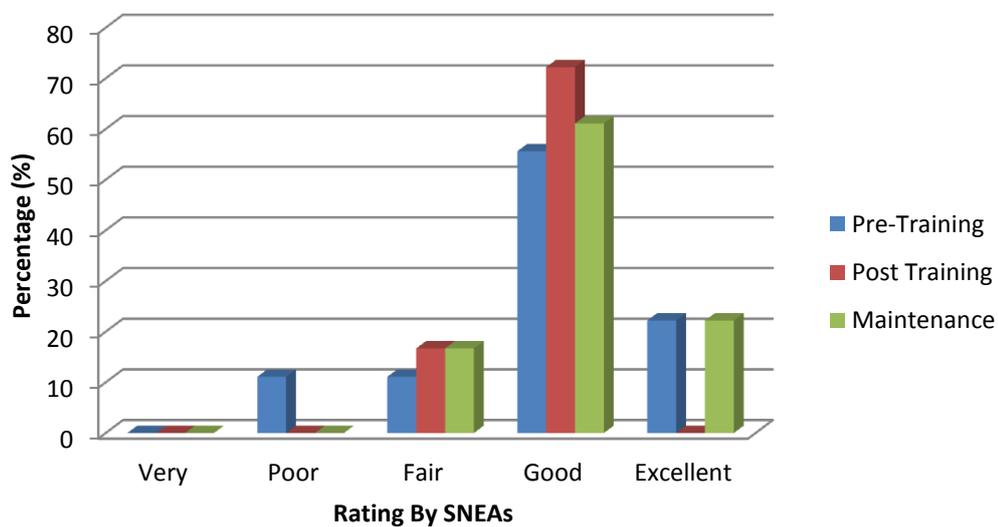


Figure 4.9. EASN’s rating of their ability to transfer information learnt in the training to the classroom, pre-training, post-training and at maintenance.

In addition to the EASN’s ability to transfer the information used in the training, the participants were also asked to rate the training that they received for usefulness in their own classroom situation, both during the post-training and maintenance testing (Table 4.20). This item was not included at pre-testing as participants had not yet experienced any of the training. The participants indicated at both the post-training and maintenance assessments that the training was of good

value for their classroom situations (median=4.00). There was no significant change in this item ($Z = -1.667$, $p = .096$) from the post-training to the maintenance assessment. The participants also rated themselves highly on being able to transfer the skills and knowledge learnt in the training to their classroom situations (median = 4.00).

Table 4.20

Questionnaire Likert-type Responses from Participants in Regards to the Usefulness of the Assistive Technology for the Classroom Post Training and After a Ten-Week Maintenance Period.

| | N | Post-training Median | Mainten. Median | Z (Wilcoxon) | p |
|------------------------------------------------|----|-------------------------|--------------------|-----------------|------|
| Usefulness of training for classroom situation | 16 | 4.00 | 4.00 | -.723 | .470 |

4.5.3 Maintenance Qualitative Questionnaire Responses.

While asking the participants to rate their skills and perceptions of confidence, the maintenance questionnaire also provided the opportunity for the EASN to present some feedback on their use of AT in the classroom after the training was been completed. The questionnaire was administered to the participants approximately ten weeks after the training. In order to focus the participants' feedback, they were asked a number of questions. The responses to these questions were analysed using NVIVO to identify repetitive themes (Table 4.21).

Table 4.21

Themes Identified in Qualitative Questionnaire Responses

| Questions | Themes |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Did you use what you learnt in training in assistive technology in the classroom? If so, how? | <ul style="list-style-type: none"> • Use of low-tech assistive technology • Use of medium-high-tech assistive technology • Ability to contribute to programs |
| Was the training relevant to your long term needs? If so, how? | <ul style="list-style-type: none"> • Increased awareness • Types of students • Improved skills |
| If your perceptions of personal competency in the area of assistive technology changed as a result of the training, do you still feel this is so? If so, how? | <ul style="list-style-type: none"> • Increased confidence • Increased knowledge |
| Do you feel prepared to teach a student with a disability to effectively use assistive technology? Why? | <ul style="list-style-type: none"> • Increased confidence • Awareness of assistive technology and benefits associated • Reservations |

The first question asked the EASN if they had used what they had learnt in the training in the classrooms in which they worked. Most of the participants (72%) responded that they had indeed been using their new skills and knowledge. Just over a quarter of the participants (28%) stated that they had not used the skills or knowledge gained. Various reasons were given for these barriers to transfer for the participants, including moving classrooms, time of year (late in term 4), no longer working in the role of EASN, and working with a teacher who was unreceptive to implementing assistive technology. For those who did use the information and skills

obtained throughout the training, three themes were identified in their responses as being important. These were the use of low-tech assistive technology, the use of medium to high-tech AT and the EASN ability to contribute more actively to the use of AT in programs for the students with whom they work.

The participants stated that they used a wide variety of low-tech AT in the classroom after the training. Some of the technologies used included reading windows (sheet of paper with a slot for restricting viewing area), rulers with handles, visual cue cards, slant-boards, self-opening scissors, magnifying glasses, adapted paper (thicker lines) and pencil grips. One participant also reported using low-tech “Aides for daily living – adapted books, seating and positioning – cushions and wedges that provide body support.”

As well as low-tech assistive technology, many participants reported an increased use of medium to high-tech assistive technologies after completing the training. These included both software and technological devices (e.g. BigMack). Computer software or online programs that supported students in the areas of maths, reading, spelling, comprehension, behaviour and memory were utilised and Boardmaker (used for constructing visual supports) and writing support devices were also used more frequently. One of the EASN stated that she “started using the ‘Writer’ on a regular basis. I set-up a spelling program on the Writer and assisted the student to self-learn”. The last theme identified by the EASN indicated that they felt more able to contribute to the students’ programs and the use of AT as a result of their training. This contribution was both in the area of planning and monitoring the students. For instance, one participant felt that her monitoring of the student’s

progress was enhanced. When asked what she had learnt in training that had been used she stated “Writing daily reports so I can see what needs to be looked at and how I can make it easier for the student and me. If it's not working, don't use it”.

All of the participants stated that the training was relevant to their long term needs. Three main themes were identified: increased awareness of assistive technology; the types of students the EASN worked with; and improved skills. Increased awareness of the AT that is available to support students’ learning and how this works was a key theme identified. This finding is exemplified by an EASN who felt “The training will be beneficial to students with special needs. I have a better understanding of how assistive technology works for the specific needs of students”. This awareness included increased knowledge of the types of AT available and ways to obtain or access the assistive technology. For example, “I know more of what is available to apply with different students needs”.

The EASN described the increasing number and variety of children with special educational needs who are (or will be) under their instruction, as being able to benefit from the training they had received. An EASN articulated the requirement to have a broad understanding of AT because “In our job we work with many different children with many different special needs that require all kinds of assistive technology”. Improved skills in the area of using AT such as computer use, construction of low-tech AT and use of various devices were seen as being relevant to the EASN in their current and future roles. One participant stated that “the training was relevant because I am able to use the knowledge and skills I learnt”.

The EASN were asked if they had previously identified a change in their perceptions of personal competency, and if this was still the case 10 weeks after the completion of the training. They were also asked to describe how they themselves had changed. The EASN felt that their perceptions of their own personal competency were still good, with all but two of the participants answering this question positively. Two themes, confidence and knowledge, were identified as being important aspects of this personal competency. The EASN felt that they were more confident with their own abilities and were more willing to use AT as a result of this confidence, for example, “I feel more confident when working with students who require AT. I have the confidence to try new types of AT”. Those who did not answer positively cited their own lack of confidence as being the barrier for them when using assistive technology; “it’s more my lack of confidence in myself through a lack of action and use”. The EASN also stated that knowledge of the AT available and ways to use this has impacted positively on their perceptions of personal competence. One comment in particular illustrated this theme; “My perception of personal competence has changed as a result of this training. I am now more confident and aware of my ability in the area of assisted technology and thus, I am able to be more confident when teaching my students”.

Participants were asked to state whether they were prepared to teach a student with a disability to use AT and why this was the case. All of the participants stated that they felt prepared to teach others. The reasons given for this perception were identified as composing of two main themes: increased confidence and awareness of AT and the benefits. There were also four participants who had some reservations about teaching others to use AT and this was identified as a third theme within the

responses. Participants stated their increased awareness of what constituted AT and the benefits of this, as being strong impetus for their preparation in teaching others about assistive technology. In regards to using assistive technology one participant said that “It has great value and addresses many children’s needs”. An increased level of confidence was also cited as being of particular importance. One EASN stated that “I have a broader knowledge and skills in assessing students’ needs and available technology. I feel confident in implementing the program”. Some of the participants said that they would feel confident in teaching others, but had some reservations in regards to the type of AT (more comfortable with low-tech as opposed to high-tech) and the technical support and training that would be available. In particular one comment was that “the low-tech stuff is very basic and so is a lot of the medium tech stuff. I may be a little wary of the high tech stuff but would be ok after some training”.

The final question in the maintenance questionnaire asked the participants to comment on any areas related to AT that they felt should have been covered more thoroughly throughout the training. There were no main areas identified, although four participants indicated that they would have liked further training in specific programs/technologies. Some of these were Boardmaker, Clicker 5, touch screens and augmentative communication devices. Two of the participants also suggested that further reference to AT that could be used to enhance students’ social skills would also have been useful. Generally, the participants stated that they were happy with the training program and the scope of the information covered.

Participants were given an opportunity at the end of the questionnaire to make general comments. The comments were positive in regards to the content of the course and the delivery. Two main themes of enjoyment and understanding were identified in the responses. Comments made included “I have learnt so much more during this assistive technology PD. It was very interesting and helpful”; “Would like to see PDs each term dedicated to areas of assistive technology which EASN could request”; and “Enjoyed the course and so glad that I did attend. It has been very beneficial. Dianne did very well and thanks to her I feel very confident”. The EASN also now understood AT in more depth than before the training was undertaken, as illustrated by the comment “I have enjoyed learning about assistive technology. I use my knowledge by sharing it with other staff at this school. I have been using skills I learnt in the classroom”.

4.5.4 Final Focus Group.

Participants were invited to take part in a final focus group to provide further feedback on their experiences during and after the AT training. Nine of the eighteen EASN participated in the final focus group sessions. There were three sessions held to accommodate the times that the participants were available. The focus groups were semi-structured, with participants asked to respond to some questions similar to those asked during the first focus group (Appendix 6) and also some questions drawn from the questionnaire responses to allow for elaboration and clarification. An open-ended discussion was encouraged towards the end of the focus group session to further explore issues raised.

The participants were firstly asked if they still felt better prepared (as was previously indicated in post-testing) to assist students with disabilities to use AT in the classroom. All of the participants indicated their preparedness to do so. There were, however, a number of conditional responses, where the EASN suggested that they would be prepared to use it more, if AT was readily available, or if they were able to access specific technology.

The EASN were asked to describe whether the training affected their feelings of efficacy in relation to using and facilitating the use of AT with children with special needs. Some of the participants found this question difficult to answer and it had to be re-phrased slightly to clarify what was meant by efficacy. They were then asked if the training had affected their feelings of confidence and competence in relation to using assistive technology. The EASN replied that they felt both more confident and better prepared to use assistive technology. As one participant stated “I think for me personally, absolutely. I really think that it made me a lot more confident, especially going from general EA into special needs”. In regards to being better prepared, six participants commented that they would be better able to tailor a program to suit a variety of children with differing special needs as a result of their training and that this has increased their self-efficacy in the area of assistive technology.

The EASN were asked if they had increased their overall use of AT as a result of the training. The majority (14) of participants had increased their use in the classroom. Thirteen participants were able to identify specific technologies which they have increasingly used in their respective classrooms. These consisted mainly

of low-tech AT in the form of reading and writing supports and the use of visual cues. The EASN also suggested that their use of monitoring tools had increased in relation to the use of the assistive technology. There were four participants who had not increased their use. These participants were able to identify a number of barriers to the use of AT in their classrooms. The barriers consisted of lack of time to practice skills, lack of time to use within the classroom, lack of access to resources (such as Boardmaker, Clicker 5), teacher resistance to suggestions for use, and no longer being in the classroom. These barriers correlate with those identified in regards to the use of skills within the classroom, in that teachers were perceived in some instances as blocking the EASN's opportunities to practice and use their skills effectively. This was stated in a number of ways including the teachers not listening to their suggestions and not using AT effectively themselves. There was reference to some teachers being 'old school' and not wishing to incorporate new technologies into the classroom. When asked if they had used their newly obtained skills within the classroom the participants had mixed responses. Time available to use skills was indicated as a negative factor. On the positive side though, collaboration between EASN was seen as a benefit in regards to skill practice and improvement, with the participants indicating that working together was a useful way of learning from each other and improving overall knowledge and skill level.

There were many barriers to implementing AT in the classroom. These included time to use and practice with the assistive technology, the availability of AT and access to this in the school setting and teachers' understanding of the AT and how it may be used in a classroom. The EASN stated that they were generally fully involved with the students in the classroom for most of their time at the school and

that they did not have any free time available to practice with the AT or to construct assistive devices. They found this to be the most limiting factor in implementing the assistive technology. If they did find some time to devote to using and accessing the AT it was potentially unavailable, particularly in relation to the more expensive and less common high-tech assistive technology. Access to the systems at the schools was an issue, with the EASN not able to change settings or access common programs (e.g. to change display setup on a computer), as they did not have Administrator rights which would allow them to do so. The attitudes of teachers towards the use of AT in the classroom were also identified by the participants as a barrier to implementation. Teachers were cited as not listening to the EASN's suggestions and not having an understanding of the technology.

Only one of the participants felt that the students under their tutelage had not benefitted in any way from their increased knowledge and skills in the area of assistive technology. She stated that she never got to use her new-found skills in the classroom at all, so the students could not have benefitted. The remainder of the participants, however, felt that the students had received some benefit, either directly or indirectly from their training, or that they would do so in the future. This was epitomised by a quotation from one participant, "Oh, definitely, I would definitely say, well look at M. She doesn't need me now...". Although possibly unable to state that the training had direct and immediate effect, many of the EASN commented that it would be useful and relevant for them in future situations and that this would have a positive impact on the students.

Lastly, the EASN were asked if they would be willing to take on further training opportunities in the area of assistive technology. There was very enthusiastic response from all participants in the focus groups. Some of the suggestions put forward by different focus group participants included a refresher course of the content they had previously covered, additional information as an update on a regular basis, and further training in specific assistive technologies that they identified as being of particular relevance to their situations (e.g., Boardmaker, Clicker 5, KidTools).

4.5.5. Field Notes

Observations of four of the classrooms in which the EASN worked indicated that the use of AT was continuing to be implemented by the EASN. In one of the integrated classrooms the EASN had sourced a variety of appropriate Smartboard activities for students with special needs. These included activities in which the student took a central role in determining responses. The EASN had placed the activities into a central depository where all staff could access them for any student. In another kindergarten classroom the EASN had modified an existing tool (a headband) and converted it to a pencil holder support for a student with fine motor difficulties. When questioned she said that she had been shown a commercial support by an occupational therapist and had modified it herself. In the remaining two classrooms a variety of mainly low-tech assistive technology was evident, including rulers with handles, roll-on deodorant paint tubs, visual cue cards, slant boards and behaviour management tools on the computer.

4.5.6 Summary of the Use of Technology.

Many of the EASN indicated positive outcomes for both themselves, and the students with whom they worked, in regards to the increased use of AT in the classroom. These outcomes consisted of increased knowledge and skills and improved confidence which all led to a reported increase in the use of some AT in the classroom. There are, however, many barriers to the implementation of even more targeted AT and AT at a higher level within the classrooms. These barriers consisted of aspects such as allocated time available to use assistive technology, teachers resistance to the use of assistive technology, availability of particular technologies (especially the high-tech assistive technologies), and access to school systems that would enable further utilisation of assistive technologies.

4.6 Overall Summary of Results

The results of this study have been reported using the three sub-questions for the research:

- How do Education Assistants Special Needs view their effectiveness as users and facilitators of assistive technology (AT)?
- Does training in assistive technology (AT) make any difference regarding the EASN's perception of personal competence and confidence?
- How well do the skills associated with assistive technology (AT) and learnt in a training environment, transfer to a classroom setting?

Prior to the training, the EASN reported that they were not overly effective in their use of AT and were not confident in facilitating the use of AT with other staff or students. As a result of the training, the EASN reported that they felt more effective in both of these roles. The training has made significant differences to the EASN's perceptions of personal competence, and confidence to use technology has increased

as a result. Both effectiveness and confidence did not change significantly from the post training to the maintenance phase, indicating that these attributes were maintained at post training levels. These results indicate that the training has impacted upon the EASN in a positive manner.

The transfer of the skills to the classroom was evident, with the use of low-tech AT being prominent. A number of barriers were described by the participants over which they generally had little to no control. These barriers included availability of the AT, teachers, and time to work with AT and students. Observation of participants and questioning via focus group interview and questionnaire suggests that they are more willing than before the training to consider and promote the use of AT in the classroom. Having presented the results, the next chapter analyses these results with a view to addressing the research sub-questions directly.