

*"It makes words sound clearer. For example I don't have to ask "what was the word" again and again". "It's just great and clearer. I just love it"* **Student, Sunshine Coast Grammar**

*"This is a valuable teaching tool. It has huge benefits for teachers and students"* **St Ambrose School**

*"Delivery of clearer and more easily understood instructions has enabled the students at the back of the room to become part of the class and they are less likely to be disengaged and distracted. The 'quieter' students now feel that they can have the opportunity to be involved. The opportunity to quickly and efficiently use the huge range of resources on the internet (including sound resources) has positively impacted my classroom"* **Cronulla High**

*"The gentle amplification of the teacher's voice enables boys to more clearly hear what is being taught or asked, meaning for the first time, some boys are able to be focussed right from the start of a lesson, rather than in the follow up phase. It is even more impressive when boys themselves realise the impact this has on their ability to learn"* **Scotch College Junior School, Melbourne.**

### What is Classroom Sound Enhancement Technology and Why is it necessary?

For all students in all settings, LightSPEED technology boosts learning by ensuring that the sounds of teaching are delivered to learners at the required strength and quality to maximise their potential.

It is clearly established that children learn more if the hearing health of classrooms is maximised.

LightSPEED technology assists teachers to better manage their classrooms. Listening conditions in teaching spaces are usually poor and do not allow the unaided spoken word and the other sound of teaching to be delivered to the brains of all students in a pedagogically satisfactory way.

The poorer the quality of the voice, the poorer a students recall of presented material. An unaided voice places additional demands on the listener which interfere with registration and comprehension of information.

This technology - sometimes referred to as soundfield technology - has evolved significantly. LightSPEED technology removes threats to embracing better listening conditions in the teaching strategies of schools. Through reducing installation complexity, improving reliability and reducing cost – and simply making the equipment easily adopted by teachers – the hearing health of classrooms can be optimised and benefits quickly gained.

As an added bonus LightSPEED technology improves outcomes for listeners with hearing impairment, those with conductive hearing loss and the even larger group of learners with auditory processing disorders.

### What does it look like?

Hear and Learn is an Australian company that supplies, services and distributes LightSPEED classroom sound enhancement products. LightSPEED equipment carries the longest warranties in the market (5 years on all equipment excluding batteries), offers the widest range of solutions and is the world's most popular equipment.



Teachers were a RedMIC – about the size of a lipstick  
No belt pack or cables. Students can use them too.



The RedCAT – perfect for standard classrooms  
NXT speaker technology exclusive to RedCAT achieves best  
speech discrimination performance

## What are the benefits to students?

### Australian and New Zealand Research

#### Benefits to acquisition of literacy and numeracy skill for all students

Massie, R. (2003). The impact of sound field amplification in mainstream classrooms. Paper presented at the A & NZ Conference for Educators of the Deaf, Fremantle, WA.

The effects of sound field amplification on specific educational goals were reported by Massie (2003) on a study that involved 242 children in 12, second grade classes in Australia. The children had no prior experience with sound field amplification, and 61% were of another family language background. Eight classrooms received sound field amplification alternating "on" and "off" with cross-over at mid-year, and the remaining four classes were amplified for the entire year, alternating between single and dual teacher microphones. Teachers received in service training prior to the experiment. Results showed significant improvement in literacy (i.e., reading and writing) and math when sound field amplification was in use. Findings were greater when students were assessed after experiencing sound field in the "on" first / "off" last rather than the "off" first / "on" last test condition.

This study supports the use of sound-field amplification to advance the acquisition of literacy and numeracy skills for children in mainstream classrooms, and not only for those children with identified hearing loss or with ESL backgrounds. Sound-field amplification may be viewed as a cost-effective part of the solution to improving classroom listening environments for all children.

#### Benefits to acquisition of literacy, phonological, comprehension and reading skills

Heaney, M. (2003). Creating enhanced learning environments: The benefits of sound-field amplification systems. The Oticon Foundation. Access online at <http://www.oticon.org.nz/pdf/Soundfieldresearch.pdf>

This study was funded in 2002 by the New Zealand Oticon Foundation. Participants included 626 students, grades 1-6, in 5 schools. There were 30 amplified classrooms and 12 unamplified classrooms studied. Performance measures showed improvements based on findings of the Progressive Achievement Tests (listening comprehension, reading vocabulary and reading comprehension, and mathematics subtests), phonological awareness tests (adaptation of the Sutherland Phonological Awareness Test), and a survey of teachers and comments from student interviews. In addition, significant findings were noted for students with histories of otitis media and students who were non-native language learners.

Evidence of improved outcomes in areas with a strong link to mastery of literacy was significant, in particular in the areas of phonologic skills, reading comprehension, and reading vocabulary. Results of the study strongly support the use of sound field distribution in all mainstream school settings irrespective of whether the children and young people belong to a particular ethnic group, have had a history of middle ear dysfunction, or attend schools of a particular socio-economic status. Classroom sound field distribution seemingly benefits all children and young people. As a result of the positive results of this study and given the stated goals for education by the New Zealand Ministry of Education (Ministry of Education, 2003b), sound field distribution needs to be considered at a policy level as an intervention to assist in reducing disparity and to improve learning outcomes for all young New Zealanders in mainstream school settings.

### International Research

#### Reducing redirection and off task behaviours, and improving scores

Chelius, L. (2004). Trost Amplification Study. Canby, OR: Canby School District. Unpublished manuscript.

The Trost study was undertaken to demonstrate the positive effects of sound field classroom amplification to local school administrators, teachers, parents, and supporting community members. LightSPEED infrared sound field systems were installed in three classrooms, grades 1, 3, and 4 for this independent efficacy study. Two types of data were gathered: 1) behavioural observations at pre-, during, and post-treatment of the classroom with sound field classroom amplification, and 2) state-wide test data comparing same-grade classrooms with and without the systems. Due to availability of data, some comparisons were made between classroom groups and some comparisons were made between reading groups. Significant findings for students in amplified classrooms were: 1) teacher redirections (any kind of redirection involving student behaviour) were reduced by 72%; 2) off-task behaviours (calling out of turn or leaving assigned seat) were reduced by 43%; 3) first grade students demonstrated an average 35% greater growth assessed by the Dynamic Indicators of Early Literacy Skills (DIBELS) Composite Score and an average of 21% greater growth on the Developmental Reading Assessment (DRA); 4) third grade students showed an average 21% greater achievement scores on Oregon's 3<sup>rd</sup> Grade Technology Enhanced Student Achievement (TESA) results and grew an average of 32% more in words per minute in reading fluency; and 5) fourth and fifth grade students showed an average of 35% more in words per minute on the reading fluency testing.

#### Improving literacy, attention, participation and learning

Dairi, B. (2000). Using sound field systems to improve literacy scores. *Advance for Speech-Language Pathologists and Audiologists*, 10 (27), 5, 13.

Concern about classroom acoustics and the impact on reading, such as the need for a favourable S/N in order to clearly hear the phonetic markers for identifying differences between words and learning the correct pronunciation of unknown words, were underlying issues in the study by Dairi (2000). This investigator used sound field systems to demonstrate improvement in literacy scores of first grade students. Participants in the study were 166 students (85 experimental, 81 control) in four experimental and four control first grade classrooms in the Broward County, Florida school district. The Informal Reading Inventory (IRI) was used as the efficacy measure by comparing mid-year and end-of-year instructional reading levels to demonstrate literacy growth. Results showed significantly greater literacy gains for students in the experimental classrooms, and in particular for bilingual and special education students. A second efficacy tool, the Teacher Appraisal of Listening Difficulty inventory of the Listening Inventory for Education (LIFE), was completed by the classroom teachers and overwhelmingly indicated positive changes in attention, classroom participation, and learning. In addition, teachers in the experimental classroom reported that the improved classroom acoustics provided by the sound field system enhanced instruction in both phonics and language.

### Improving early literacy development and reducing challenges for 'at risk' students

Flexer, C., Biley, K., Hinkley, A., Harkema, C. & Holcomb, J. (2002). Using sound-field systems to teach phonemic awareness to pre-schoolers. *The Hearing Journal*, 55 (3), 38-44. Accessed online at [http://www.audiologyonline.com/articles/arc\\_disp.asp?id=474](http://www.audiologyonline.com/articles/arc_disp.asp?id=474)

An interesting study by Flexer, Biley, Hinkley, Harkema, & Holcomb (2002) was designed to determine if early phonological and phonemic awareness training coupled with the use of sound field amplification would yield a reduction in the number of children identified as "at-risk" readers on the Yopp-Singer Test of Phonemic Segmentation (Yopp, 1995). Emphasis on immersion of pre-school children in phonemic and phonological awareness is a common trend today to promote early literacy development. Three classes of typical 4-year-olds participated in this year-long Ohio study where students were identified and tracked through the end of their first semester in kindergarten. Each group received different early phonological and phonemic awareness interventions. Group A (control group; n=23) received the school district's standard pre-school and kindergarten curriculum. Group B (phonological and phonemic awareness group; n=7) received direct, group phonological and phonemic awareness instruction four times weekly. Group C (phonological and phonemic awareness group; n=23) received the same intervention as group B and was provided with sound field amplification. Teachers in Groups B and C received in-service on phonological awareness and Group C received additional in-service on sound field amplification. Four-speaker infrared systems were installed in a Group C pre-kindergarten and a kindergarten classroom. Results showed that both Groups B and C achieved significantly higher scores on the Yopp-Singer Test than students in Group A. Trends observed in this study suggest that: (1) the sound field system produced a more consistent positive effect across Group C than the treatments used in Groups A and B; (2) the level of homogeneity in Group C established the students as being less "at-risk" for reading problems than children in the other two groups; and (3) phonological and phonemic awareness training to promote early literacy development was more effective when sound field amplification was used.

### Reducing special education referral rates

Long, S. & Flexer, C. (2001). Sound field amplification for all. *Advance for Speech-Language Pathologists and Audiologists*, 11 (27), 10-11.

Long and Flexer (2001) reported that special education referrals declined by nearly 50% after 37 elementary classrooms (kindergarten through fifth grade) received sound field amplification and used the sound enhancement technology for an eight-month period. After using sound field amplification, the average special education referral rate of 4.6% was a significant decline from the average 7.72% referral rate for the nine previous academic years. As a result of these positive findings, the Onconto Falls, WI school district has included sound field amplification in its Universal Design approach, which specifies that this technology can be implemented by general education teachers and not specifically special education teachers. Another positive outcome was that the district expanded its Universal Design plan to include sound enhancement amplification in all middle school classrooms.

### Improving reading, spelling and attendance behaviours

Loven, F., Fisk, K. & Johnson, S. (2003). Classroom amplification systems on early academic achievement and attention. Poster session presentation at the American Speech-Language-Hearing Association Annual Convention, Chicago, IL.

Significant improvement in reading and spelling by second grade students in an amplified classroom were revealed in a study by Loven, Fisk, and Johnson (2003). Appraisals of student achievement in three core academic areas (reading, spelling, mathematics) were conducted three times during a 6-month period for 48 students in two regular education second grade classrooms in Minnesota, one amplified and the other unamplified. While significant gains were shown by students in the amplified classroom for reading and spelling, t-Tests did not show a difference between the classrooms for mathematics. These investigators also obtained two subjective measures of student listening behaviours, and a two-way ANOVA showed a significant interaction for the two main variables of room treatment and time. Comparison of pre-treatment and during-treatment measures revealed findings similar to other studies in that students demonstrated a robust increase in attending behaviours following installation of sound field amplification.

### Increased compliance to directions in students with ADHD

Maag, J. W., & Anderson, J. M. (2007) Sound-field amplification to increase compliance to directions in students with attention deficit hyperactivity disorder.

Sound Field Amplification should be pursued even if its only benefit is decreasing the time it takes student to follow directions. Improving the listening conditions in a classroom appears to positively impact students' abilities to attend to and comply with teachers' directions by providing a more clearly audible signal. If the amplification of a teacher's voice increases the speed with which students and ADHD follow directions, instructional momentum - the pace of teaching without interruption - will likely be maintained. This effect, in turn, will help negate the problem of non-compliance that hinders students with ADHD from academic and social learning. The less time teachers spend repeating directions and redirecting students with ADHD, the more time they should have to provide academic instruction.

### Improvements in reading, maths, language, science and social studies and reducing number of students considered 'at risk'

McCarty, P. & Gertel, S. (2003). Designing the best learning environments to maximize student performance. Presentation at the Council of Educational Facility Planners International convention, Chicago, IL.

Results of a two-year study reported by McCarty and Gertel (2003) clearly demonstrate a reverse trend in failing scores by fifth grade high need students on the Stanford Achievement Test (SAT). Sound field amplification was introduced to classrooms where students had shown declining scores on the SAT; however, following the implementation the sound enhancement technology, SAT scores for fifth grade students improved an average of 12% in reading, 14% in math, 17% in language, 20% in science and social studies, and an overall test battery increase of 14%. Even greater gains of an average additional 10% increase were documented during the second year for students in the amplified classrooms. An additional finding showed that sound field amplification coupled with phonemic and phonological awareness training reduced the number of students identified as at-risk learners.

### Improving discipline

Rittner-Heir, R. (2001). Sounds like a winner. *School Planning & Management*, 40 (1), 92-94.

When sound field systems were installed in all of Florida's Ocoee Middle School classrooms as part of the SMART school of the future project, the principal noted a 40% decline in discipline incidents over a one year period. Sound field amplification, at least in part, contributed to the students' increased opportunities to focus and remain on task (Rittner-Heir, 2001). Anecdotal comments from students, teachers, parents, and administrators also support the benefits of this listening enhancement technology.

## What are the benefits for teachers?

### Reducing vocal strain and fatigue

DiSarno, N., Schowalter, M. & Grassa, P. (2002). Classroom amplification to enhance student performance. *Teaching Exceptional Children*, 34 (6), 20-25.

DiSarno, Schowalter, and Grassa (2002) conducted a study with high school students to determine the effect of teacher bias on the results of classroom amplification use. The study involved a two-member team teaching arrangement in a multi-age classroom (grades 9 through 12) for nine students with learning disabilities. The *Listening and Learning Observation (LLO)* and an adaptation of the *Evaluation of Classroom Listening Behaviours (ECLB)* were completed independently by both teachers prior to using the sound field system and again following 6 and 12 weeks of use. Findings indicated a significant improvement in the listening and academic behaviours of these students with learning disabilities after using the classroom amplification for 12 weeks. The teachers also indicated that the primary benefits they noted from using the sound field amplification were: (1) an increase in the teacher's ability to gain and maintain students' attention, and (2) a decrease in teacher vocal strain and fatigue.

### Students learn more if teachers' voices are unstrained

Morton and Watson concluded in a study titled "The impact of impaired vocal quality on children's ability to process spoken language" concluded that "Both qualitative and quantitative data clearly show that dysphonic (impaired) voice adversely affects a child's response to spoken material. The children's comments indicate that they had difficulty with the vocal changes in the impaired voice, perceptually it was unpleasant.

The relevance of these subjective comments is underlined by the quantitative data which shows reduced performance, for both word recall and inference identification, with the dysphonic voice. These findings are in keeping with the hypothesis that poorer voice quality hinders recall of presented material. The impaired voice seems to place additional demands on the listener which interfere with registration and comprehension of information.

### Voice problems may limit career options of teachers and current performance

Smith, Gray, Dove, Kirchner and Heras in study title Frequency and effects of teachers' voice problems' conclude that "Teachers were more likely to report having a voice problem (15 vs. 6%), having 10 specific voice symptoms, and having 5 symptoms of physical discomfort. They averaged almost 2 symptoms compared with none for nonteachers. Likewise, teachers were more likely to perceive that a voice problem would adversely affect their future career options, had done so in the past, and was limiting their current job performance. Over 20% of teachers but none of the nonteachers had missed any days of work due to a voice problem. These findings suggest that teaching is a high-risk occupation for voice disorders and that this health problem may have significant work-related and economic effects.

Smith and others in study titled "Frequency of voice problems among teachers and other occupations" concluded "One in five teachers had missed work due to voice problems in any one year, five times the rate for the workforce as a whole".

## What do other teachers and students say?

### The Jannali High School

"Recently I had the privilege of having the LightSPEED Sound Field Amplification system installed in my classroom. I am a huge believer in new technology - I teach it in fact, and after 35 years of teaching this system truly impressed me. It has been a natural occurrence throughout my teaching career to project my voice when necessary - to attract the class' attention, speak to a student at the other end of the room or even be able to have the students hear me clearly at all times. Classroom management was much easier. Directions were repeated less often because students heard me the first time. My students responded quickly and sensibly to directions given. They became very comfortable with the fact that my voice was the same volume throughout the room. The learning environment was more settled and positive. The microphone worn around the neck is easy to wear and I forgot I was wearing it most of the time. I even got out to my car one day with it still on!!!!

The feedback from my students was ALL positive and especially my Year 10 computing Studies class who used it when presenting their Personal Profile to the class. They were very impressed and adjusted the volume of their voices accordingly. I would not hesitate to recommend this system to any teaching professional."

### Student Charlotte Robinson (Hearing impaired)

"I really liked this sound because it gave you the good quality sound that you get from a microphone but much clearer and without the echoing acoustics of microphones. I find the echoing is what makes microphones harder for me to hear. The soundfield system is also better in the distribution of sound in the room, it was like the person talking into the microphone is sitting next to you and there wasn't the usual imbalance as from a normal amplifier. This equal sound is better (from my experience) than using the audio loop anywhere. With the audio loop you have to sit in a certain area for good reception and even then the reception may not be that good. Often you actually have to position your body in a certain way to receive good sound and if you move out of position, you also move out of reception which makes it hard if the person speaking is mobile. The small microphones worn around the neck mean the people talking also can't stray from the microphone which produces bad sound and there may be more of a chance that they would give the microphone to people in the audience when they have questions etc. FM systems give very good sound, but they are easily susceptible to interference from metal objects and rustling noises. I found the soundfield system a very effective sound system.

### Student Aaron Johnson

"I believe the speaker system in the learning centre has helped improve the quality of our first year 10 assessment. The speakers enabled the class to hear the presentation clearly as sometimes we have trouble hearing Mrs Mason speaking when she is in the other side of the room. I think it also gave me confidence in speaking and I didn't have to repeat anything. This would be a great investment for the school and really allow for better teaching"

### Scotch College Junior School, Melbourne

With a number of our boys presenting with Auditory Processing issues, the Lightspeed Sound Amplification system was just what we were looking for and in a very short time, has had a noticeable impact on the lives of many boys.

The gentle amplification of the teacher's voice enables boys to more clearly hear what is being taught or asked, meaning for the first time, some boys are able to be focussed right from the start of a lesson, rather than in the follow up phase. It is even more impressive when boys themselves realise the impact this has on their ability to learn.

### Student Stewart Tamp

"There has been a new speaker systems set up in the Learning Centre. It was only a trial but we were able to use it for our slide show presentation. This new system benefited me in many ways; it enabled me to speak with more confidence as I know everyone could hear without me having to shout. Along with me using the speaker through a microphone it played sound from the computer that was on my presentation. I think it helped me greatly with the quality of my presentation and would be an excellent learning facility to invest in."

### Cronulla High School

"I have noticed that students are more enthusiastic and prepared to participate in the class activities. They now out compete with each other in offering to read out their answers as they get to use the microphone. We have had mini drama where students read 'plays' that engage students and maximise their learning. The delivery of clearer and more easily understood instructions has enabled the students at the back of the room to become part of the class and they are less likely to be disengaged and distracted. The 'quieter' students now feel that they can have the opportunity to be involved. The opportunity to quickly and efficiently use the huge range of resources on the internet (including sound resources) has positively impacted my classroom. I would recommend the use of this system for its flexibility and its scope to impact student learning."

### Middleton Public

"Great! Kids loved it!"

### St Albans Secondary College

"I love this system and want to use it everyday"

### Lajamanu School

"I am amazed at the improved sound quality without the short comings that occur with mere amplification of sound"

"I notice that I am much more relaxed as there is less need to project my voice. It keeps classroom noise to a manageable level. It's wonderful"

### Toongabbie Public School

"It made me more aware of the rise and fall of my voice. When I wasn't using it, I had to raise my voice quite a lot more. My hearing loss student can sit anywhere now and still hear me and she was able to hear audio visual aids much better while increasing her attention span"

### Annandale Special School, Townsville

"Works perfectly!"

### Coonamble Public

"Really notice when you aren't using it because your throat gets sore! Kids will pick up that you don't have it within about 5 minutes or less"

### Menai High

"For my personal instruction, the system is great. Students are much more attentive"

### Middleton Public

"The sound system eased my voice and workload. It gave a new interest to those students with interest and ability challenges. All of my students were engaged and enjoyed these lessons and the only difference was the addition of the sound system."

### Special Education Services, Lismore CEO

In the middle of 2007 one of our schools requested support to purchase a surround sound amplification system which was what we were using for the past 10 years in our schools. When we made enquiries of Australian Hearing services they informed us that they could no longer access surround sound systems. When asked what we could do the RedCat systems were recommended. We made arrangements to have a demonstration of the RedCats and purchased one to trial in one of our schools.

The trial was very successful and the word soon spread around our schools of this wonderful new resource. Some of the things people like about RedCats are:

- # extremely simple unpack, assemble, use.
- # the excellent even sound it provides
- # the unobtrusiveness of the RedCat in the room ( after a while the students forget its there )
- # no need for professional installation or when the system needs to be moved to another class
- # the system is cheaper than what we were paying for the SS systems ( they are in the price range for schools )
- # the ease with which it can be linked to other equipment e.g. computer, smartboard etc.

We have now got about 12 RedCats and we are about to order more.

### **Monivae College, Hamilton Victoria)**

We have purchased and used the Redcat Sound System in our Year 7 area, having purchased it in 2007. Our Year 7 model often includes 2 Year 7 classes working together with both their teachers i.e. 50 children with 2 staff. Sliding doors open to allow this to happen, thus the students are in a long rectangular room. The amplification system assisted the teachers to make themselves heard clearly; they could talk at a normal voice level and be heard distinctly. We also found that the students were able to concentrate more effectively as the teachers' voices were well projected in all parts of the room. Students who had mild hearing problems or problems filtering out group sounds, also benefited when the amplification system was used.

I used the device at a staff meeting to show the whole staff and those presenting found that it made speaking to a group much easier, they could speak at a normal voice level and those listening, enjoyed the "intimate" feel of the presentation.

### **Hearing Impairment practitioner, NSW DET**

As part of my role in DET, NSW I encourage and assist schools in the acquisition and use of voice capture/amplification gear in the classroom. In my two regions on the North Coast of NSW (Murwillumbah and Lismore) we have approximately 80 old Soundfield Amplification Systems ("SAS") in classrooms and approximately 18 LightSPEED 'RedCat' systems. There is also a sprinkling of other brands of classroom amplification systems as well as some personal FM systems. My predecessor operated in this role for 16 years and was very pro-active in accessing funds and in promoting the use of classroom amplification systems as a way to assist children suffering from Otitis Media to function better in the classroom. I have been in this role now for 4 years and have also promoted the use of amplification gear in the classroom. I made contact with David Downing and was introduced to the LightSPEED system.

I no longer recommend the SAS systems from Australian Hearing. I found that the technology of the old SAS which is based on radio waves was often problematic particularly in larger towns such as Tweed Heads. And, with schools now having computers in every room all networked with wiring running along the outside of classrooms I encountered a new problem. There is so much power going through the networking cabling that the cabling was putting noise and crackle into the SAS systems. I also felt that quality had been compromised in order to keep the price down and I found I was installing new systems which were more problematic than some of my older systems. The two-piece transmitter and microphone were often felt by teachers to be uncomfortable to wear. Another disadvantage was the time necessary to move the system if it was placed in a room to assist a particular child.

Schools recognise the problems of middle ear disease and the hearing loss associated with ear disease. They also recognise the problems of vocal strain experienced by many teachers. But money is always a problem.

To the advantages of LightSPEED. Teachers report they really like how easy it is to use LightSPEED equipment. Many teachers like the microphone hanging around the neck. It gives a good sound strength and can be adjusted. They love not having a transmitter hanging off their clothing. They LOVE the clean sound with no crackles or interference delivered by the receiver/speaker and that it is a tidy size and attractive to look at. It is very light to lift and carry. It can be easily mounted on the back or side wall and this prevents the other teacher nightmare of children/adults touching it and fiddling with the dials. It is easy to move it to another classroom should this be necessary. Batteries are no longer a problem or on-going expense. The recharger is SO....simple.

I always like to give teachers a trial use of all amplification gear. Not all teachers are good users. There are various reasons for this. Some have hearing problems themselves or their teaching style doesn't suit amplification. Some have neck problems and find a neck worn microphone uncomfortable. Some teachers have unrealistic expectations and are disappointed with the result of amplification.

Other teachers are excellent and committed users of amplification. They take care of the equipment and appreciate its usefulness.

### **Rosary Catholic Primary School, Canberra**

Teacher Kate Markcrow offered the highest possible response ("very effective") to the statements "helps every student hear the teacher clearly, improves student attention during instruction time, improves classroom management, improves instruction quality for special needs students, increased student participation and interaction, improves the overall learning environment in the classroom and has significant potential to improve students' academic scores". A teacher also offered "When I spoke everyone stopped and listed engagement improved" and stated that the greatest beneficiaries were "A couple of struggling boys." The overall comment was "I love this system and want to use it every day!"

### **St Charbels School, Punchbowl, Sydney**

Teacher Joanna Zidros offered "The LightSPEED system is good to use in all classes. I do not need to project my voice and it does not feel dry at the end of the day". And from teacher Meghann Fogerty "Some of the boys are hearing me for the first time all year!"

### **Westmead Public School, Westmead, Sydney**

The RedCat Soundfield Amplifier has been a blessing for me. At the beginning of the school year you are constantly talking to your students to establish routines and settle them throughout the day. When you have Kindergarten you talk even more and by the second week of term you're struggling to speak. The RedCat has saved my voice and every student wherever they are in the classroom can hear me at all times. This is vitally important to me because I have a student with a hearing loss. I sometimes forget to position myself appropriately so she can hear me and this isn't such a great concern with the RedCat in the room. Classroom management has never been so easy and my students love using it as well! The RedCat benefits all my students.

### **Advisory Visiting Teacher for the Hearing Impaired, Queensland DET**

All teachers responded very positively to the use of the system, particularly those that had a particularly noisy teacher environment due to double teaching spaces or small rooms with hard surfaces and increased reverberation. Some teachers and teacher aides begged us not to remove the system, and one teacher had actually screwed the system into shelving and I had to unscrew the system to remove it. Teachers reported that the second student microphone helped 'formalise' group time and students learnt not to speak unless they had the mike – decreasing group noise (especially effective in prep classrooms). The Soundfield was so effective with one student with mild hearing loss that it was recommended to the student's new school when his family relocated to Brisbane. Teachers report that behavioural problems decrease and learning (listening) increases.

Teachers liked the fact that the speaker was at the back, not the front, creating an effective sound field throughout the room. The infra-red system produced good sound quality, even though the system was portable. Teachers liked the way that the system is easily carried due to the large handle at the back and the more horizontal shape of the speaker (rather than vertical). This allows teachers to move the system to specialist lessons e.g. music, computer, etc. Schools also like the way that unlimited portable units could be put into the school, since the technology allows this, unlike the portable Soundfield FM systems. Most teachers have asked their schools to purchase a soundfield system after the trial. Schools like the way that these portable systems don't require fitting by Q Build. They also like the 5 year warranty on the Redcat and the fact that the microphone can be dropped and knocked and doesn't break.

All in all, we are very impressed by the Redcat and are quite pleased to recommend this system to others.

### **Warren Central School**

"Just fantastic. It saves your voice and all students can hear much better using the system."

### **Marcus Whitman High School in Rushville, New York**

"For years I tried to record my lessons with different microphones in conjunction with the electronic white board, but I could never achieve good audio so I just gave up. Then it dawned on me to use the new LightSPEED mic system, and wow, it works perfectly. A simple patch cord from the amplifier to my computer is all it took. These two technologies together are just mind boggling.

If I have to miss a class, I'll record the lesson and just have the sub hit the start button on the computer. All the numbers, graphs and charts appear on the smart board and they're hearing me crystal clear. The sub was amazed because she felt like I was in the room teaching.

The other cool thing is that kids can have access to the complete audio-visual session at any time. If they miss the class or just want to review the lesson they simply download the shared file or I'll hand them a loaded jump drive and they are good to go. "

### **Carey Baptist School, Perth**

"I really noticed that the students at the back of the class could no longer remain off task when I was speaking, because they could hear exactly what I was asking, and they responded immediately. My voice wasn't so sore at the end of each lesson. Students were also able to use it for their oral presentations, which meant that their peers were able to listen, rather than get bored quickly, because they were able to hear clearly. I didn't feel the need to raise my voice so much, because students responded beautifully without needing to restate what I was saying."

### **Karalundi School, WA**

In response to 9 questions relevant to learning acquisition, behaviour management and the like (where 2 teachers were asked to offer scores out of 10 – 0 being lowest, 10 being highest) average scores were 8.87 and 8.14. Both teachers offered 'yes' to all other questions including Student attentiveness, listening and comprehension have improved?

Other comments were:

The Hear and Learn Unit was introduced into my classroom at the end of 2008 and I have been using it consistently since the beginning of 2009. At first I thought the novelty aspect was a strong factor in improving students' motivation to learn but I have discovered that they are really taking in more and therefore developing a greater interest in what is being taught and discussed. I find the unit particularly valuable in literacy sessions in which there is a significant amount of reading and class discussion. I like the way it 'tunes out' when I am talking to individuals or dealing with a behaviour issue. The unit is very easy to maintain and I have no problems with students who often wish to investigate new equipment a little too closely! If I do not remember to put the mic on I am quickly reminded and often if I have chosen not to use it for a particular session the students ask me to put it on. I believe more students in my classroom are engaged in the learning since we have had the Hear and Learn Unit and I really appreciate getting more attention and response from them. Julie Cates, Grade/level of class Yrs 4, 5, 6 – 15 students

And

I have had limited experience in the classroom with the students, so these observations are from the little time I experienced it with the students, but mainly from the verbal feedback from the class teacher. However, I can say from personal experience as someone with only 50% hearing, that I found I was able to hear easier because the sound is directed around the classroom. So, as a teacher with impaired hearing the benefit is great. Anne Tonkin, Principal

## Some technical information ....

### NXT speaker technology exclusive to RedCAT achieves best speech discrimination performance

NXT wave bending speaker technology – a cornerstone of the RedCAT system – allow high-frequency energy preservation broadcast in all areas of a standard classroom.

Prendergast, S. (2001). In the *Journal of Educational Audiology*, 9, 1-6 was able to demonstrate significantly better speech discrimination performance when using the bending wave speaker. Half-list presentations of the California Consonant Test were administered to 31 third and 33 fourth grade students with normal hearing. The students were assessed using both the traditional and the bending wave speakers with the output set at +10 dB S/N. Results for the two listening conditions were statistically significant, with a mean score of 58.06% for the traditional speaker presentation and 65.68% for the bending wave speaker.

### Infra Red Transmission superior

Voices of teachers and students are captured by Redmics. No cables or belt packs are involved. Transmission from these microphones is by infra red light hence ensuring no clash with other forms of audio equipment. There is a no drop out guarantee with all LightSPEED equipment.

### Integration with other classroom equipment simple

Audio from up to four other sources can be captured too. This includes DVD, VHS, interactive white board, MP3, computer etc. It is important to think not only of equipment you use now, but also equipment you may use in the future. An electronic sound source can be connected to a RedMIC. That is, from the earphone outlet of a sound source – eg computer, MP3 etc – into the auxiliary jack of the RedMIC, audio is captured and delivered. This ensures flexibility and integration options.

### Recharging of RedMICS simple

LightSPEED RedMIC's are recharged using a cradle – that is, batteries are never removed. They are simply placed in the cradle at day's end in readiness for another day of use in the morning. This is significant in ensuring equipment is adopted by teachers given its ease of use. Again, no cables.

### Self assembly removes cost and threat of installation

RedCAT unit is 65 centimetres wide, 35 high and 8 centimetres deep. Optimal performance is achieved by placing the unit at or near the middle of the rear wall in a classroom; either by placement on a shelf and cupboard, or mounted to the wall using the bracket and screws supplied with each system – much the same way you would hang a painting. Plug and play straight into a power outlet.

### Best for remote locations

The RedCAT system is self assembled. This means should there be a need for service, the unit is sent to Hear and Learn's service facility; there is no need for on-site work which reduces cost and ensures best support.

### Support

A five year warranty applies to all goods to the exclusion of batteries. Online webinar support offered to all clients and Hear and Learn is represented Australia wide. Hear and Learn telephone support around the clock.

### Widest range

Hear and Learn have solutions for all teaching spaces

- Libraries
- Lecture Halls
- Computer and Science Labs
- Language facilities
- Multi purpose rooms
- Portable solutions