Evidence Based Practice to support Theracrew resources

INTRODUCTION

Theracrew provides teachers of regular and special education with resources to design learning experiences that meet their students individualized needs. Students within the same classroom can use different levels of the same KLA resources so that all students are working towards the same outcomes. Theracrew's resources are modified activities / workbooks that allow students to demonstrate their knowledge of a particular concept whilst working in a way that suits their own learning style.

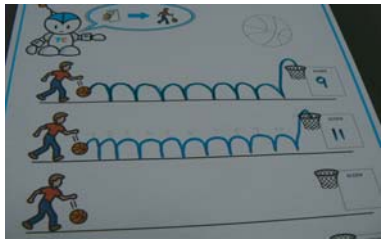
Theracrew resources provide teaching staff with the flexibility to design their own programs without needing to spend hours creating resources, thus enabling staff to spend more time directly teaching. Theracrew resources are specifically designed to meet the learning styles of children with low to high support needs. The latest research on instructional and intervention strategies has been incorporated into each resource as well as strategies to assist with maintaining student's confidence and motivation.

Our resources are currently being used in both regular and special education settings across Australia and internationally.

BENEFITS OF PRODUCTS

- Can be used to meet the needs of students with varying ability levels and learning needs including ADHD, learning difficulties, ESL, Speech and Language difficulties, Asperger's and Autism.
- Materials can be used with the entire class to support principles of inclusion.
- Teachers and Teacher's Aides will spend less time planning and developing resources and will have more time for direct teaching
- Students will demonstrate less off-task and behavioural difficulties that are related to learning issues,
- Students will have access to educational materials that suit their individual learning styles whilst not segregating them from their peers

Theracrew's resources have been uniquely developed to allow students to meet the classroom outcomes but in a way that suits their individualized learning style. Class management is enhanced by having all students working towards the same goals but in modified ways.



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Do executive functioning skills predict school performance and academic ability?

Executive functioning skills have been implicated in many aspects of learning, including language comprehension, reading and writing. For children just entering school many of the tasks faced are completely novel and place particularly heavy demands on cognitive processes such as short term, working memory and executive functioning (Bull, Epsy, Wiebe, 2008).

Students with poor working memory have been found to make frequent errors in a range of learning activities. For example:

- remembering and carrying out instructions
- keeping track of places in tasks
- writing whilst formulating text &
- carrying out mental arithmetic

These common classroom activities require students to simultaneously process and store information, these skills are examples of executive functioning.

Children under 7 years rely heavily on visual-spatial representations or external aids to support keeping information in short term storage. For typically developing children, Bull, Espy, Wiebe (2008) found that visual spatial short term memory span was found a predictor specifically of math ability. They also found that children (7-14 yrs) with low scores on working memory measures that were linked with executive functioning typically perform below expectated standard in National curriculum assessment of english, maths and science in England.

When looking at student outcomes which is more important:

Measuring their knowledge vs their writing skills?

Students with low to high support needs are known to have poor academic outcomes and mental health issues. Figures from the USA report that ADHD affects approximately 3-7% of school aged children. More than 1/2 of all children diagnosed fail at least one grade by adolescence and 23-32% fail to finish high school (Kofler, Rapport, Alderson, 2008). Studies of children with ASD report anxiety symptoms at a rate of 6-24% and depression at a rate of 6-17% (Ben-Sasson, Cermak, Orsmond, Tager-Fluberg, Kadlee, Carter, 2008).

Dickerson and Calhoun (2008) found that the majority of children with High Functioning Autism Spectrum Disorder have a learning disability in written expression. Because these children have difficulty with both written expression and handwriting they need other adaptations in school. If our outcomes are to measure students learning or knowledge, handwriting impedes our ability to get an accurate representation of students skills.

Zingerevich and La Vesser (2009) found that there is a relationship between executive functioning skills and school participation e.g. initiation, organising and monitoring. Students need to develop greater understanding in 'how' to take part in school activities, with the emphasis on the process of learning rather than how the student demonstrates their knowledge.

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What do executive functioning skills have to do with Cerebral Palsy, ADHD & Autism?

There is now substantial evidence that executive functioning plays an important role in learning during childhood (St-Clair Thompson, Gathercole, 2006). These skills are shown to be areas of concern for children with a range of diagnoses and developmental skill levels.

Aside from their physical difficulties, children with Cerebral Palsy have been shown to have executive functioning difficulties. 46% of children in mainstream and special education settings have difficulties, which are having greater impact on their math versus reading skills (Jenks, de Moar, van Lieshout, 2009).

Caras, de Alba, Taverner (2009) found that ADHD symptoms and early academic skills are partially mediated by executive functioning deficits. Thereby providing further support for the fundamental role of these higher order cognitive functions. 26% of children with ADHD demonstrated a specific math learning difficulty.

Children with Autism Spectrum Disorders also demonstrate executive functioning difficulties. The impact of these deficits may be reduced by structuring learning activities with the aim of reducing processing difficulty and storage loads (Jenks, de Moar, van Lieshout, 2009). Given the wide range of abilities of students some may require more or less support in some curricular domains (Machalicek, O'Reilly, Benefras, Sigafoos, Lancioni, Sorrells, Lang, Rispoli, 2008). Theracrew's workbooks have been designed to support executive functioning skills and to allow teaching staff to support the wide variety of skill levels that we typically find within one classroom.

How does designing the layout of information on the page impact on attention and memory?

Accumulating evidence suggests that several variables appear to influence children 's visual attention. These include small, seemingly insignificant factors such as distractors on the borders of assignments and the type of academic assignments (Kofler, Rapport, Alderson, 2008).

When the information load is too great our ability to detect change is impaired (Awh, Barton, Vogel 2007). A limitation exists on information processing from perception to working memory - if information passed is of high bulk or complexity then presenting it all together may restrict learning (Alkhalifa, 2009).
To compensate for this learning activities are then structured in ways that prevent working memory overload, for example by reducing processing difficulty and storage loads as appropriate and encouraging the use of external memory aids (St-Clair Thompson, Gathercole, 2006).

Theracrew's resources have all been designed by therapists who make decisions about quantity of information, spatial layout, complexity of cues on each page. Students find it easy to identify what is expected of them because their attention is automatically drawn to that information. For an adult its a similar experience to trying to find a favourite shirt in a messy cupboard versus a neatly organise one. Which one do you think is easier?

Optimal learning depends on reducing the complexity of information to a level that does not exceed capacity. External aids reduce processing load (Halford, Baker, Mcgredden, Bain, 2005). We are used to thinking that students with Autism have enhanced visual-spatial skills.This may be true to a certain point, but its complexity dependent. (Bertone, Mattron, Jelonic, Faubert, 2005). Adock and Curo (2009) report that instructional procedures need to effectively provide stimulis control in order to promote learning. Theracrew's resources are designed to direct students attention to the 'important' things to pay attention to so that their reserves are not used up by trivial information. The use of non-transient systems of communication such as Boardmaker PCS is also justified due to executive functiong skills (Nunes, 2008).

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Teachers already simplify the complexity of students work. What do Theracrew's products do differently?

The complexity of learning activities can be broken down into task related characteristics and learner related characteristics. Each continually impacting on the other. Teacher's report feeling ill-prepared or without the proper resources to implement evidence based practices, particularly with children with Autism Spectrum Disorders. Special Education staff also report that implementation of reseaerch-based practices is not always feasible (Machalicek, O'Reilly, Benefras, Sigafoos, Lancioni, Sorrells, Lang, Rispoli, 2008).

Learning tasks can be structured differently based on complexity constructs in the following areas:

- degree of difficulty
- degree of stimulation
- amount of work required / information processing load associated with the task
- amount of knowledge required
- size
- number of possible solution paths
- degree of task structure
- non-routineness or novelty of task
- degree of uncertainty
- inter-relatedness of components
- function of task characteristics

Eras, Sigafoos, Lancioni, Sorrells, Lang, Rispoli, 2008).

These characteristics of the learning experience then need to be matched with the information processing capacity, experience and knowledge, learning style of individual students (Alkhalifa, 2009). Theracrew resources reduce the complexity of tasks for students not only in the quantity of information required to be processed at one time, but also in the strategies that students need to implement at one time to demonstrate their knowledge. Theracrew has designed different levels of the same curriculum materials to allow students to demonstrate their knowledge in a way that matches their processing limits and learning style.

How does interspersing easier tasks into the day impact on attention and behaviour?

Theracrew's resources are designed to reduce the overall workload for students allowing them to actively participate as a full class member in group planned lessons rather than needing individual modifications. The interspersal of tasks that students find easier within other activities has been shown to be effective in reducing various forms of escape behaviour such as lack of joint attention, emotional responding, physical withdrawal from instructions and other off-task behaviour (Adock, Curo, 2009). This strategy has been shown to be effective with a range of students including:

- Autism Spectrum Disorders
- Mental retardation
- Delayed language development
- Learning difficulties
- Behaviour difficulties

as well as typically developing children.

This research covers a broad range of school curriculum including:

- pre-academics
- maths
- spelling
- language arts &
- reading

Adcock and Curo (2009) also highlighted that students with Autism Spectrum Disorder continued to demonstrate idiosyncratic academic difficulties with the regular education curriculum and instructional methods, even with individual aide support. Thereby highlighting the need to address the way in which students with varying ability levels and learning needs are supported in schools (Adock, Curo, 2009).

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Which is more likely to promote independence in the classroom?

Teachers Aide **Structured activities**

Access to a Teacher's Aide in the classroom provides support to assist with students individual learning needs as they arise. Their role often becomes that of a translator for what is happening around the student. The Aide prioritises the information that the student needs to pay attention to and reduces the amount of effort required. Prompt dependency is however, an unfortunate downside to having a helper. Removing that support may result in a reoccurrence of the off-task behaviours and a decline in productivity (Hume, Odom 2007). Having access to enough Aide time is an issue for most families and there is the increased cost associated with the staff, as well as training and supervision issues. Whilst students are able to remain in regular education settings with the support of an Aide, there are social implications for students feeling like they are being singled out.

The proverb "Give a man a fish, feed him for a day. Teach a man to fish, feed him for a lifetime" is a good analogy when talking about the benefits of structured learning activities. Having someone help identify for you what you need to pay attention to works in supporting your executive functioning skills for as long as the helper is present. It does not however help the students learn how to work it by themselves. Structured learning activities can be designed to provide increased comprehension, reduce the working load required and reinforce the learning of how to learn. The important information or priorities to pay attention to can be highlighted within the activity thereby reducing reliance on an adult to guide the student through the task. Activities can be designed to suit a wide variety of learning styles and skill levels. Structured activities are designed by specialists who modify the complexity of the tasks allowing students to access the curriculum.

Theracrew's resources have all been designed by specialists with expertise in processing, task design and executive functioning.

"Give a man a fish,
feed him for a day.

Teach a man to fish,
feed him for a lifetime."

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