The aim of this article is to offer early childhood teachers a strategy to assist oral language teaching and procedural thinking for young children, through the introduction of 3-D mind maps. Three dimensional mind maps are a highly effective tool for providing engaging, kinesthetic, and sensory experiences that enable young children to connect both mentally and physically with experiences. This article describes and highlights the linguistic aspects of 3-D mind maps, and how such mind maps can be used as a powerful tool for oral language development.

To talk, to discuss, to satisfy curiosity
A young child’s desire to talk, question and investigate will occupy most of their day as they sate their curiosity through interaction with others and their environment. Generally, children want to discuss what they already know and explain what they are learning. When the context and problems presented to them have meaningful connections, children will engage themselves in productive learning (Education Department of Western Australia, 1997).

Learning comes naturally when children are engaged in experiences that provide interesting resources and contexts. The use of physical and conceptual tools such as language, symbols and objects help children to engage in ideas and support their learning (Fleer, 2006). An engaging learning experience should also be interesting to the child and invite active participation. Once interest is stimulated even the shyest child can be a willing, interactive group member, regardless of cultural background and language accomplishment.

A supportive environment and collaborative engagement, along with the manipulation of objects, presents an ideal sociocultural setting to enhance learning (Robbins 2005). Interaction and discussion, which requires and respects both speaking and listening skills, assist children in satisfying their natural curiosity. Discussions can assist children to manipulate their thoughts into meaningful sequences, question interactions and develop language naturally.

Why integrate a 3-D mind map with oral language learning?
Speaking and listening rank highly in early learning social skills. Talking with a familiar group of people, in a familiar environment and using familiar objects assists early discussion skills and spontaneous verbal contributions by a child. Purposefully developing oral language for conversations and problem solving in collaboration with others improves opportunities for more advanced, critical literacy skills required for debate, reading and writing.

Meaningful sharing experiences challenge children to express their opinions, to question, to make comparisons, to explain, and to listen and respond to others (Curriculum Council, 1997). This provides children with confidence and knowledge that their input is important. Acquisition of these skills can be enhanced through the creation of 3-D mind maps, whose process is described below.

In the construction of these mind maps children represent their ideas verbally and graphically, and interact with each other using familiar resources and a guiding educator. During the map’s construction, children relate personal experiences that are connected to a central idea and suggest how these may be connected to others’ ideas. Through purposeful discussion, which is guided and modelled by the teacher, children learn to listen to the suggestions of others, question, discuss and reason how alternative ideas can be connected. They also learn to modify their own thinking and knowledge. The end result is a visual representation, using the children’s own words and drawings. Because children are participating at a personal level in the process of developing the 3-D mind maps they are able to place themselves at the centre of their own learning (Howitt, 2009).

Milikan (2003) noted that verbal discussion is pivotal to learning. Where teachers ask children to represent their ideas, theories or plans in a graphic way, possibilities are provided for concept formation and problem solving to occur. Three-dimensional mind maps encourage children to talk with purpose.
about their ideas while offering teachers multimodal avenues for teaching and learning of literacy and procedural thinking. During the construction stage of the mind maps, communication skills are challenged, rehearsed and advanced through the use of open ended questioning and integrating speaking, listening, reading, writing and viewing skills.

What is a 3-D mind Map?
Mind maps are a visual representation of knowledge. They are based upon a central idea and connections that are logically thought out to link related ideas (Buzan & Abbott, 2005). The map grows in several directions and ends up looking a little like a web. Two-dimensional mind maps may be constructed with the aid of a pen and paper, or with a computer. Three-dimensional mind maps place more emphasis on the use of real objects with which to promote the sharing of knowledge and the creation of connections (Warden, 2006). Radiating branches grow from the object that represents the central idea and other objects are added to demonstrate relationships and connections familiar to children.

Step by step construction of a 3-D mind map
Howitt (2009) developed a six-step procedure for developing 3-D mind maps based upon children’s drawings. The six steps are preparation, setting the scene, drawing children’s knowledge, creating connections, connecting with real objects, and revisiting the mind map. These steps are described below in relation to the topic of cleanliness. Each step is illustrated with an example relating to cleanliness, highlighting the linguistic aspects of the mind map, and supported with a photograph.

Step 1. Preparation
Establish a focus topic object and lead question. Gather a range of objects (or images) that relate to the focus topic and question, and meet children’s interest. The catalyst for the focus could be a child’s interest, a concept that requires elaboration or clarification, or determining children’s prior knowledge at the start of a topic. Objects that are of interest to the children and relate to the focus concept are then collected. The creation of a 3-D mind map is best conducted in a small group. This allows all members of the group a chance to actively contribute to the mind map.

Example focus object: a life-like doll
Example focus question: What do you know about cleaning different parts of your body?
Example range of objects: soap, flannel, hair shampoo, nail brush, tissues, cotton buds, baby wipes, toilet paper, nail polish remover, bubble bath, hair brush.

Figure 1. Some of the objects used to construct the cleanliness 3-D mind map.

Step 2. Setting the scene
Gather the children in a circle or semi-circle. This is best done in small groups rather than a whole class to enable verbal and active participation. Introduce the topic by asking the focus question. Place the focus object on the floor (or on the centre of a large black circular mat, or an appropriately coloured sheet).

Example: The topic of cleanliness is introduced, the focus question asked, and a doll to represent the human body, is placed in the centre of the circle. Alternatively, a picture of a human body could be used as the focus object.

Figure 2. The life-like doll is placed on the floor to support the focus question ‘What do you know about cleaning different parts of your body?’
Step 3. Drawing children’s knowledge

 Invite the children to draw a picture of their response to the focus question, or to find an object/picture in the classroom to illustrate their response. Annotate drawings, or add key words such as hands, teeth, hair, to help children make the connection between their drawing and the word. Include the illustrator’s name. This provides an example of writing and associates that child with their thoughts and drawing, while also acknowledging the accomplishment of the child.

Example: One response could be ‘I wash my hands with soap’. So that child is asked to draw the outline of their hand. A second response could be ‘I clean my teeth’. This child draws a picture of teeth. Hence, the mind map is developed around the different parts of the body that can be cleaned as identified by children.

Step 4. Creating connections with repetitive words

 Use strips of paper to establish connections between the focus object and what children have drawn or collected. A common phrase (or repetitive words) is written on these strips of paper. Encourage the children to ‘read’ or repeat the words and construct full sentences as the strip is placed next to objects.

Example: Repetitive words are used as connections between the doll and the drawings. These words are ‘I clean my …’ Hence, statements become ‘I clean my [picture of a] hand’ or ‘I clean my [picture of] teeth’.

Step 5. Connecting with real objects

 Pass around the collected objects and have each child choose one. In turn, each child identifies the object, its use and then places it on the drawing where they think it belongs. For example, a toothbrush is placed on the drawing of teeth, or soap on the drawing of a hand. As an object is placed on a drawing, encourage children to repeat ‘I clean my [body part] with [object]’. Can the child explain why they have placed the object on that body part? Does the child have a story to share about the object? An adult ready to write this story could add it to the map, near the object of the story. Encourage the children to move around as they build the mind map and to talk about what they are doing.

The placement of an object in an unexpected or unconnected pathway will lead to discussion among the children. This is an integral part of children’s learning. If a child decides they want to make a new connection, let them replace the object and explain their reasoning to the rest of the group. A child may decide that one object belongs on several pictures, so discuss the possible ways that this could be achieved such as buying more of the object, using photographs of the object, writing the name of the object, or cutting the object into small pieces.

Example: One child may place the soap on the picture of the hand. Another child, who has selected a nail brush, may wish to add a picture of fingernails to the mind map to specifically accommodate the brush. The group discusses the best way to do this, and could decide to add fingernails to the picture of the hand. A third child suggests that soap belongs everywhere, and wants to chop the soap into pieces and place some on each picture. The group should discuss this dilemma and find a solution. Another
child may reject having the soap placed with the picture of the face, as they may remember problems with getting soap in their eyes.

Extension ideas to pursue more oral language

Two possible extensions of 3-D mind maps are presented below to allow the development of further oral language.

Highlighting cultural differences and language

Identification of some items used to represent an idea will cause discussion based on how an object may be used or named differently in the children’s homes. Cultural differences can be enlightening as children call objects alternative names using either another language, a different title, or inform the class of a new use for the object. For example, one use for a nail brush could be to clean fingernails, while another use could be to scrub the dirt off potatoes. Another example highlights different language for the same object. The face washer could also be known as a flannel, a towel, la serviette, or a bath cloth. The different words for the same object can also be displayed, as shown in Figure 8 with a face washer.

Step 6. Revisiting the mind map

If possible, leave the 3-D mind map on display. Children may wish to revisit it and add more detail, especially objects brought from home. The map is flexible in nature. If children wish to move parts of the map around, or take away or add new parts, they should always have a ‘story’ to tell as to why they feel a change is necessary. Have strips of paper and pens available for children to make additional connections.

If space and resources are required for another map, record each group’s results with digital photographs that show both the process (to demonstrate the children’s thinking processes) and the end product (to illustrate achievement). Display these photographs for children to see and discuss.

Example: Photographs were taken of the end product, and placed on display for discussion.

Figure 5. Different objects that were placed on the hand drawing, along with a story.

Figure 6. An example of a completed 3-D mind map on ‘What do you know about cleaning parts of your body?’

Figure 7. Highlighting the different words associated with one object, in this case a face washer.
Running commentary through role play
As young children enjoy the theatre of role play, oral language can be extended using running commentary. While one child acts out one of the cleaning rituals, another child provides a commentary of the actions for the rest of the group. This is an enjoyable activity, where exaggeration and elaboration of actions are encouraged. For example, a child could carefully remove the lid of the toothpaste tube and gently squeeze a little paste onto a toothbrush and ... oops! Too much! The toothpaste on the floor now has to be cleaned up. Through the use of running commentary and role play, connections between verbal language, body language and story telling are rehearsed.

Advantages and limitations of 3-D mind maps
There are many advantages to using 3-D mind maps which centre on the use of real objects that are familiar to most children and are easily obtainable. The use of visual clues plays a crucial role in triggering children's memory. Through handling objects, children are stimulated to think, assisting them to connect with prior knowledge, and encouraging them to present their views and ideas (Warden, 2006). Three-dimensional mind maps have no one correct answer and they can continue to grow as children bring objects from home to make new connections. Social skills can be enhanced as children take turns, discuss, respectfully listen, and acknowledge another's ideas and contributions. Concentration is practised as children remain focused on the process rather than the product in the construction of the 3-D mind map. Confidence can be boosted for all children as they come to realise their contributions are useful and important. Even the shyest children and those with limited language skills can participate successfully as any of the objects used in the map or its construction can become a talking point. With 3-D mind maps the child is placed both physically and mentally at the centre of their own learning (Howitt, 2009).

Three basic limitations have been identified with 3-D mind maps (Howitt, 2009). First, time is required to thoughtfully gather a range of objects that would encourage children to talk, think and connect once a focus idea has been established. Second, an appropriate focus question has to be constructed that will lead children in the direction required to establish the activity. Third, space is required to construct the map and to place the completed map in an area where it can be displayed and discussed with others.

Conclusion
Using 3-D mind maps in a group situation supports a socio-cultural approach to teaching and learning. This approach acknowledges that children do not learn in isolation. They learn through physical and verbal interactions with other children, adults and from their cultural experiences gathered from both school and home. The 3-D mind map allows children to make connections between prior information and new information enabling them to retain the information more effectively. Three-dimensional mind maps provide engaging, kinaesthetic, sensory and linguistic experiences for young children that promote language, critical thinking, and the sharing of knowledge. Three-dimensional mind maps are highly flexible, allowing items to be added or removed as needed. As they have no one correct answer and integrate readily across the curriculum, these attributes make 3-D mind maps a highly effective tool for establishing meaningful conversations and connections in the early childhood setting.

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References