Integrating Language Services and the Alberta Education Curriculum:

An Extension for Grades 4-6

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Abstract

Language is extensively used within the school environment, sometimes in areas which might not be evident unless working with a child with language impairments. Kristen Hedley (2012) created a tool called the "SLP curriculum" for teachers and speech-language pathologists to use collaboratively, which identifies language demands within the curriculum. This tool used the learner specific outcomes from the Programs of Study for Mathematics, Social Studies, English Language Arts and Science for Grades K-3. The purpose was to identify key vocabulary, language skills and other skills that are embedded throughout the curriculum objectives for these Grades (including glossaries for "other language skills" and basic concepts). The present tool has been designed for Grades 4-6 and has been modified from the original work to include aspects and concepts that are more appropriate for older students. Modifications include changing definitions, adding skills and concepts and including a new glossary that codes skills that highlight increasing cognitive demands. The end result will be an expansion of the "SLP curriculum" that will hopefully be utilized within Alberta classrooms in order to enhance the education of students with language-learning difficulties.

Introduction

Background and Purpose

According to Alberta's Inclusive Education Policy, all students are entitled to access to learning experiences that are relevant and meaningful, and are accompanied by appropriate instructional supports (Alberta Education, 2015). The modern inclusive classroom is a language intensive environment, not only as it relates to academic content knowledge, but also because of the social communication demands of the classroom setting (Paul, 2007). For students with language impairments, these demands are particularly challenging. Thus, appropriate instructional supports for these children include access to Speech-Language Pathology services within the classroom and accordingly, rely on inter-professional collaboration between Speech-Language Pathologists (i.e., SLPs) and classroom teachers (Spann-Hite, Picklesimer, & Hamilton, 1999; Keefe & Hoge, 1996).

Both SLPs and teachers are facing new professional challenges as Alberta's educational policies have shifted towards inclusive learning. While teachers are required to manage students with increasingly diverse needs, SLPs are having to provide effective services to children with communication needs within the context of the mainstream classroom (Alberta Education, 2009; Tollerfield, 2003 as cited in Hedley, 2012). In addition to changes to their individual responsibilities, teachers and SLPs also face a number of barriers relating to classroom collaboration. These include, but are not limited to: lack of communication, insufficient time for quality liaison, SLPs being viewed as "visitors" to the school, professional status, and lack of time and resources. (Hartas, 2004; McCartney, 1999; Wren et al., 2001).

While there are a number of obstacles on the road to collaborative practice, this approach is not without its rewards. Indeed, collaborative efforts between teachers and SLPs have been shown to be effective for both students with speech and/or language deficits and typically learning students in a number of areas. Children in these classroom have benefited from improved learning of basic concepts, phonemic awareness, vocabulary, comprehension of cognitive linguistic concepts, writing and spelling abilities, and transfer of vocabulary to the home environment (McEwan, 2007; Throneburg, 2000).

While collaboration can enhance the educational experience of all children, this mode of service delivery between teachers and SLPs is requisite for students with language deficits. If these students are not properly supported within the inclusive classroom, their potential for academic and social achievements will be compromised (Hedley, 2012). Thus, it is essential that steps be taken to reduce existing barriers and enhance the overall quality of collaboration between SLPs and classroom teachers.

The "SLP Curriculum," first developed by Hedley in 2012, was created to support interprofessional collaboration between classroom teachers and Speech Language Pathologists (SLPs). It was designed as a resource for these professionals to use to bridge their knowledge, thereby increasing the effectiveness with which they can address the many needs of their students in the classroom. The tool includes specific learner outcomes and language skills embedded in those outcomes, for Grades K-3 in the Social Studies, Science, Mathematics and English Language Arts Programs of Study. The language skills embedded in the curriculum outcomes were classified as key vocabulary, basic concepts, and other language skills (Hedley, 2012).

The primary purpose of the current tool is to extend the existing framework to include more advanced skills embedded in the learning outcomes for older elementary students in Grades 4-6. Alterations to the tool reflect the different linguistic expectations for students in Grades 4-6, as compared to students in younger grades. Specific modifications will be discussed in greater detail later in the paper. This tool, like the original K-Gr. 3 SLP Curriculum, provides classroom teachers and SLPs with a working document to facilitate collaboration and the creation of functional goals for students.

It is important that common resources like the SLP Curriculum are created to support the interprofessional efforts of teachers and SLPs because collaboration between these professionals is essential to student success. Building strong connections between teachers and SLPs can help them to provide superior services by focusing on skills that are relevant in the classroom, thereby enabling students to achieve yearly classroom objectives (Flynn, 2010). Having SLP supports embedded in the classroom context also plays an essential role in facilitating generalization of targeted speech and language skills (ASHA, 1991).

Another benefit of the SLP Curriculum is that it promotes professional development through collaboration. Collaborative programming indirectly provides SLPs and teachers alike with opportunities to grow as professionals (Hedley, 2012). Joining forces with teachers allows SLPs to learn valuable details about developmentally appropriate materials and curricula, as well as how to manage classroom lessons. Teachers, on the other hand, may learn to incorporate speech and language supports into their daily classroom routines (O'Connell, 1997). This is beneficial not only for children with speech and language needs, but for the classroom as a whole (Flynn, 2010). Thus, this extension of the SLP Curriculum may contribute not only to

interprofessional collaboration and improved academic outcomes for older elementary students, but also to the professional development of teachers and SLPs alike.

The current tool was developed by elaborating on curriculum expectations and learning outcomes in order to highlight embedded language skills. For instance, consider the following objectives from the Alberta Education Curriculum:

- *4-10 (5) "Identify examples of plants that have special needs."*
- *4-5 (3) "Describe alternative methods of disposal."*
- *4-6 (4) "Explain how rollers can be used to move an object."*

In interpreting the specific learner objectives, careful attention is needed to differentiate between task requirements. Consider the above mentioned expectations to *identify*, *describe*, and *explain*. Although these terms may appear similar at first glance, it is important to distinguish between them because they require different levels and types of skills in their application. Where *identify* requires a student to recognize and name an object or concept, to *describe* a student must have more knowledge about that entity such that they can convey additional details about its characteristics and features. *Explain* requires additional reasoning as the student has to relate cause and effect (Board of Studies Teaching & Educational Standards NSW, 2002). Thus, outcomes that may appear to be equally demanding can in fact differ in terms of the skills that students must possess in order to meet the requirements.

Curriculum entries were analyzed carefully, as the underlying task requirements are often more involved than they may appear at first glance. Such is the case for the following outcome from the Grade 4 Language Arts curriculum:

- *3-2 (1) "Locate information to answer research questions using a variety of sources, such as maps, atlases, charts, dictionaries, school libraries, video programs, elders in the community and field trips."*

While the task requirements for this excerpt may seem straightforward, there are several skills that are necessary for a student to meet this expectation. The child might be able to find resources that are appropriate for the topic, but will not necessarily be able to find the needed information effectively because he or she doesn't understand the text structure.

The "SLP Curriculum" was created in order to meet the needs of students with LLD by highlighting particular task requirements that may be challenging for these students. It is designed in such a way that it breaks down each learning outcome into its component parts, thereby clarifying what is required of the student to complete each task. For instance, consider the following from the Grade 4 Science Curriculum:

- *4-10 (6) "Recognize that a variety of plant communities can be found within the local area and that differences in plant communities are related to variations in the amount of light, water and other conditions."*

This learning outcome can be broken down into a subset of required skills including: drawing inferences, understanding cause and effect, and using knowledge from personal experiences.

For teachers and SLPs, having access to this tool means that they can spend less time interpreting the curriculum, and instead focus on integrating appropriate supports to help students meet classroom demands. Ultimately, this may enable teachers and SLPs alike to be more effective and efficient, leading to greater student success in the classroom.

The current version of the "SLP Curriculum" includes the same subject areas as the original developed by Hedley: English Language Arts, Math, Science, and Social Studies. While significant language demands are found in all of these core content areas, the subjects differ in where those requirements lie.

For Language Arts, the language demands are within the content of the subject itself. The focus of the task is language, and it is expected that students will be taught, and will subsequently use, examine, and manipulate language in such a way that they can meet the expectations for a given grade-level. Appropriate supports will also be applied to scaffold the child's comprehension and expression of language.

This is in contrast with the remaining subjects, where language is not the task itself. Instead, language is embedded in the instructions or information that has to be accessed prior to the task as well as to carry out the task. In Math, for instance, students with language deficits may have difficulty accurately linking words to their associated meaning, reading multi-digit numbers, and comprehending word problems (Newman Thomas, Van Garderen, Scheuermann, & Lee, 2015). In the classroom, this might manifest in that the student with language needs is

unable to complete a homework problem, not because he/she doesn't understand how to do a particular calculation, but because that student is unable to decipher the word problem to understand which mathematical process (e.g., subtraction) needs to be applied. It has been proposed that this relationship, between language and mathematics, may be one of the least studied barriers to learning mathematics (Donlan, 2007; Morin & Franks, 2010).

As in Math, there are requisite language skills, or "fundamental literacies" (Wallach, Charlton, & Christie, 2009, p. 204), that can influence a student's subsequent ability to interact with Science and Social Studies content knowledge. This is owing to the fact that the particular style and form of these subject areas, also known as "derived literacies" (Wallach, Charlton, & Christie, 2009, p. 204), require a strong foundation in fundamental literacy. Without this foundation, which includes basic decoding and comprehension skills, students with LLD are at a great disadvantage. Particular skills that can be challenging for these students during Social Studies instruction might include: drawing inferences, contrasting information, evaluation sources, and "putting events in context" (VanSledright, 2002; Villano, 2005; Yore et al., 2004, as cited in Wallach, Charlton, & Christie, 2009, p. 204). While the Science curriculum involves some of these same skills, it is also unique in that it calls for more concise writing and thinking, interlocking definitions, taxonomies, and managing of technical terms (Wallach et al., 2009).

Thus, we can expect that students with LLD will require additional support in Science and Social Studies, as they may lack a strong foundation in the fundamental language skills necessary to support the derived literacies of these content area subjects (Wallach et al., 2009).

Although all students in the classroom stand to benefit from the information outlined in the SLP Curriculum, this tool is designed specifically for children with language learning

disabilities, or LLDs (Gough, 2008). LLDs are a type of learning disability in which reading, writing, and spelling are affected as a result of underlying weakness in oral language skills. Although the speech of children with language-learning disorders may not be obviously impaired, they will often have experienced delayed language and/or speech during development (Paul, 2012). Owing to the fact that these children lack a strong foundation in oral language, it can be very challenging for them to keep up with the heavy language demands of the classroom.

Literature Review

As previously mentioned, Hedley's SLP Curriculum was designed for students from kindergarten through Grade 3, whereas this extension of the tool is designed for children in Grades 4-6 and is of similar format to the original work. However, an exact replica of Hedley's methods would be inappropriate as this tool needs to highlight the increasing curriculum demands in the upper grades. A literature review was undertaken to inform this update. First, a review of the key characteristics of older students with Language Learning Disabilities (LLDs) will be presented. This will be followed by a discussion regarding the increases in curriculum demands, including how these increases can impact students with LLD and how curriculum demands will be acknowledged in the SLP Curriculum tool. This section will also briefly touch on some of the current language interventions that are available and why a further solution is needed in order to support older students with LLD.

Students with Language Learning Disabilities

Language Learning Disability (LLD) is one of many labels used to identify a person with language problems. This particular label (also referred to as Language Learning Impairment), acknowledges the fact that language problems do not occur in isolation, but that it is rather directly related to learning difficulties (Bishop, 2014). The characteristics of an older student with LLD can vary from child to child but may include difficulties in the following areas (Gerber, 1993; Larson & McKinley, 1987):

- Cognition and academic skills (e.g. being able to apply past experiences to new challenges; gaining information from texts at grade level)
- Comprehension and production of linguistic features (e.g. have a vocabulary capable of expressing ideas and experiences; give directions with clarity and experiences)
- Discourse (e.g. to make a report, tell a story and explain a process in detail; to select main ideas and supporting details from a lecture)
- Social demands (e.g. participate in discussions and conversations with adults and peers)
- Nonverbal communication (e.g. be aware of body language and social distance)
- Survival language (e.g. to comprehend and produce concepts and vocabulary required across daily living situations)

In addition to the above characteristics, students with LLD may also experience difficulties in each of the major language domains. According to Paul and Norbury (2011), phonology tends to be relatively non-problematic for these students, other than some sound distortions and perhaps simplification of one or two phonological processes. However, students

may have difficulties with phonologically demanding tasks or phonological awareness, which are important for literacy (Paul & Norbury, 2011). It is important to identify these students as early as possible and engage in preventive intervention in order to maximize reading success. In regards to semantics, there are two types of receptive vocabulary which may be challenging for a student with LLD to understand: instructional vocabulary and textbook (or classroom content) vocabulary. For expressive vocabulary, students with LLD may struggle with lexical diversity or word retrieval (Paul & Norbury, 2011). Further details about vocabulary are provided at the end of this section. Syntax and morphology can be especially difficult for students with LLD; Scott (2009), as cited in Paul & Norbury (2011), found that these children can struggle with comprehending complex sentences in their class readings. Additionally, passive sentence structures and decontextualized language (which will be discussed further) may be challenging for students with LLD, while in terms of expressive language, their sentences may be simple or disorganized (Paul & Norbury, 2011).

Combining the decreased capacities in the above areas with the increased demands of the progressively challenging curriculum can prove problematic for students with LLD. The following are examples of what this might look like in the classroom.

Five cognitive processes that are involved in text comprehension include: schema knowledge (i.e., what the macro structure, or format, of the particular text should look like), discourse knowledge, an ability to make inferences, metacognitive processes (i.e., strategy use and comprehension monitoring) and motivational factors (e.g., the student's interest level of the subject) (Kamhi & Catts, 2012). If a student is assigned reading material (such as a challenging expository text) and the demands of comprehending that text exceed his or her cognitive

capacities, that child will be unable to complete the task at hand successfully (Skoczylas, 2015 adapted from Peters & Guitar, 1991).

A study conducted by Muth (1982) looked at the cognitive demands that were placed upon sixth grade students who were given word-based mathematical problems. In order to solve the problems, the students were found to need both computational (quantitative) abilities and reading (verbal) abilities; in other words, the students needed to cope with two different types of cognitive demands. One significant conclusion was that "reading ability plays a major role in the solution of arithmetic word problems" (Muth, 1982, p. 14). The author further suggested that there needs to be an emphasis, during teacher training, on integrating reading abilities with computational abilities.

The goal of this tool is to help Speech Language Pathologists and teachers identify where their students' breakdowns occur and how that might be reflected in their language and schoolwork. The following section focuses specifically on aspects of the curriculum for upper elementary grades that could be challenging for students with LLD to grasp.

Increase in Curriculum Demands

As in all academic areas, the language and literacy expectations change for students in upper elementary grades. If the student in question does not have skills which should have been mastered in earlier grades, they are at risk for falling further behind in upper elementary grades and beyond.

As children advance from early elementary grades to later ones, there is a significant shift in literacy that can leave many students struggling: going from "learning to read" to "reading to

learn" (Spor, 2005). This is referred to as Stage 3 in Chall's Stages of Reading Development (Chall, 1983 as cited in Paul & Norbury, 2011) and it is regarded as a major change in a the way a child reads as they enter Grade Four. Stage 3 involves reading and comprehending more complex materials and being able to do so at an increased rate (Paul & Norbury, 2011).

A student is expected to be able to make this shift seamlessly if his/ her lower level reading skills (i.e. decoding and word recognition) are fluent and automatic (Paul & Norbury, 2011). However, if the student lacks a firm grasp on these lower level skills (as outlined above in the linguistic characteristics of children with LLD), he/ she will not have enough cognitive resources to dedicate to the higher level skill of reading to learn.

An additional challenge is that the texts that students are expected to read in the later grades may be expository (or informational) in style and as such may be more difficult to understand (Fang, 2008). This means that the students have to switch to a new text format (that is no longer narrative) and they have to be able to conceptually grasp new kinds of information.

There are unique challenges associated with expository text reading. Fang (2008) lists four unique features which would not have been encountered in reading materials for younger students: technicality, abstraction, density and authoritativeness. The first feature, technicality, refers to the type of language that is likely to be present in a specialized expository text. The vocabulary is specific to the text subject and is unlikely to be connected to the student's everyday life. Abstraction is the manner in which a subject can be written about without using concrete vocabulary. This type of language facilitates figurative and inferential language and is often used as a starting point for discussions. Density refers to the sheer amount of information that is packed into one text. As Fang (2008) pointed out, the density of information can create a

cognitive overload for a student and can thus limit their information processing abilities. Finally, authoritativeness is the voice of the text. Unlike narrative stories, which can sound interpersonal and engaging, expository texts tend to be more distant and impersonal and reading texts like this can be less comfortable to students (Fang, 2008). If a student starts to struggle with expository texts, they may begin to fall behind academically (Spor, 2005). In other words, if a child is entering the fourth grade without fluent reading ability, this could potentially be very detrimental to other aspects of their education.

Making the shift between "learning to read" and "reading to learn" is significant and challenging for students. It is of the utmost importance that SLPs and teachers work together in recognizing students who may be experiencing breakdowns in their language and literacy skills. Ideally, these students should be identified prior to Grade 4 to ensure that they get enough support with the higher reading demands. The goal in the current project is to capture the skills necessary for "reading to learn" by adding concepts and skill areas to the SLP curriculum tool that are especially relevant for upper elementary students.

Executive Functioning and Semantic Networks

Another key set of skills important in upper elementary school and beyond is referred to as "executive functions". Executive functioning is a theory that many use to talk about the way the brain performs to think, act, and solve problems (i.e., purposeful, goal-directed behaviour) (Meltzer, 2007). Tasks involving executive functioning allows one to learn new information, as well as access and apply previously learned information to new situations. For many, performance of tasks that require executive functioning often occur without awareness or

conscious thought; however, students who have problems with executive functioning, including those with LLD, can not perform these same tasks automatically. Definitions of executive function vary but most contain the following elements (Meltzer, 2007): goal setting and planning; organization of behaviours over time; flexibility; attention and memory systems; explicit and implicit learning; and self-regulatory processes (i.e., self-monitoring). Individuals with LLD may have difficulties creating order to the information that they have, due to deficits in planning, problem-solving, organizing, and/ or managing time. Challenges with these higher-level skills are often most evident as the child enters upper elementary grades, such as Grades 4-6. This is a period in which students can be characterized as "actively inefficient learners" due to the difficulties they face in accessing, organizing, and coordinating mental tasks simultaneously in academic areas such as reading and writing (Meltzer, 2007). These students with LLD are also considered inefficient at learning because of their difficulties with the following:

- self-regulatory strategies (i.e. checking and revising during learning)
- problem solving strategies (i.e. limited awareness of what strategies to use to increase efficiency of problem solving and learning)
- cognitive flexibility (i.e. thinking about different concepts at the same time and mentally switching back and forth)
- sorting, organizing, prioritizing information
- identifying major themes (i.e. become too focused on details and as a result, become stuck and have trouble with initiating new tasks)

Even though executive functions may not be directly related to language skills, they are key foundational skills that are important to address when working with students with LLD. Some of these skills include being able to understand and apply hierarchy of organization, personal experiences, and brainstorming. Each of these terms is discussed below.

Children in upper elementary grades need to understand how to organize information in a hierarchical structure. 'Macrostructure' is a term that is commonly used to refer to the overall organization of information (Kintsch & Rawson, 2005). For instance, a student needs to be able to categorize information into sections by using headers, to indicate superordinate information, and sub-headers, to indicate subordinate information. Thus, the student needs to not only understand the information at hand, but also be able to organize it appropriately, which could prove challenging to students with LLD if they have difficulty with organizing information.

The cognitive skill of using personal experiences is best understood in terms of the situation model (Kintsch, 1998). Text processing creates two representations of the text in the reader's mind. One representation is of the situation described by the text (which includes the use of personal life experiences to develop that representation) and the second representation is of the meaning and arrangement of the text (Zwan & Radvansky, 1998). One can use personal experiences to better comprehend by applying that personal knowledge to elaborate on the text. However, students with LLD can have trouble with integrating personal experiences as they may have difficulty accessing and applying their own previous knowledge to new situations.

An additional challenge that students are faced with when dealing with tasks of increasing demand is the need for efficient semantic networks. A semantic network can be envisioned as a knowledge web/network with numerous individual concepts that have

connections between those that are related (Sowa, 1991). When one learns something new, the person solidifies that knowledge by finding relations (more connections in semantic network) to that concept. However, forming these semantic networks can be challenging for students with LLD for many reasons. Firstly, language material disappears faster in their immediate memory, not allowing for this information to be encoded and solidified in their semantic networks (Schwartz, 2010). In particular, words that occur less frequently decay in their memory at a faster rate than those that are more frequent, resulting in weak representations of this knowledge in their semantic network. The rapid decay of less frequent words prevents students from strengthening representations by forming connections to related concepts. Another reason children with LLD experience difficulties forming semantic networks is the previously mentioned challenges they may experience with executive functioning skills. The need for efficient semantic networks is of particular importance in these older grades because most of what they are expected to learn is decontextualized. Implications of weak representations of knowledge in a semantic network can be seen in many cognitive skills active in school tasks, such as evaluation. When having to evaluate, the student uses known information and criteria to assess information and make a judgement. However, this is difficult for those with LLD because they must be able to activate and retrieve these previous representations while simultaneously creating a new representation. Quick and efficient activation requires strong connections between representations.

Brainstorming involves a student needing to generate multiple ideas about a given topic, which implies activating semantic networks and making links to previous knowledge (Nijstad & Stroebe, 2006). However, if as previously mentioned, the student with LLD has a much faster

decay of unfamiliar words, it is increasingly difficult for the student to make connections between these weak new representations and previous representations. In addition, weak connections in a semantic network provide less support for making meaningful links between ideas. The need to use semantic networks in order to make connections is foundational to many cognitive skills; thus, inefficient semantic representations will directly impact these abilities. In order to identify curriculum tasks that may be challenging for children with LLD, it will be important to consider how inefficient semantic networks might be at play.

Language Skills in Upper Grades

In addition to the above-mentioned increases in curriculum demands and difficulties that can arise in the areas of executive functioning and semantic networks, there are also many language skills that become increasingly challenging for Grades 4-6. This includes understanding inferences; being able to comprehend decontextualized language; recognizing different types of text structures; and using metalinguistic skills.

In the original SLP Curriculum, Hedley described "inferences" as follows: "When something is not explicitly stated, the ability to draw conclusions from given information or data; 'reading between the lines' " (p. 137). In order to generate inferences, or to construct meaning from seemingly unrelated entities, individuals are required to access relevant background knowledge (Kamhi & Catts, 2012). Students can use this knowledge to support connections in memory, and as a retrieval structure to activate related knowledge (Kintsch & Rawson, 2005). This use and activation of semantic networks (as previously defined) are necessary skills in supporting inferencing. Because students with LLD have difficulty accessing and applying prior

knowledge to new situations, it is unsurprising that generating inferences is also a challenging task for this population. There is an increasing need for inferencing skills as students move into higher grades. Examples of tasks requiring inferences are common in the curriculum. For instance, consider the following from the Grade 4 Social Studies Curriculum:

- *4-2 (2) "Assess, critically, how the cultural and linguistic heritage and diversity of Alberta has evolved over time by exploring and reflecting upon the following questions and issues:"*

In the above example, inferencing skills are required for the underlined section of text. Though not explicitly stated, in order to meet this objective, the student must be able to link the ideas of cultural heritage, linguistic heritage, diversity, and Alberta. The student must subsequently draw connections between this knowledge and different time periods in order to demonstrate how each has evolved.

In the earlier grades, learning in the classroom is much more contextualized than it is for upper elementary grades. Activities and language learning occur in a familiar way where the context surrounds and supports the learning of a concept. However, as children enter upper elementary grades, the language becomes increasingly decontextualized. In other words, teachers often talk about topics with which the child has no experience and therefore, the child must rely on the verbal and written text the teacher provides as opposed to using the context for support. This may be especially difficult for those students with LLD. Not only do these children have to deal with increasing demands of the curriculum, but they also have to learn to

rely more on decontextualized language; this can be cognitively overwhelming and place students with LLD at a disadvantage. Students can be supported by being taught the new, highly decontextualized and abstract information by making explicit connections to their experiences or previously learned knowledge in order to provide more contextual support.

As previously mentioned, students in upper grades are required to make a shift in how and what they read and it was important to capture this major transition in the SLP curriculum. To reiterate and expand, there is less focus on oral-literacy skills (i.e., story telling/narratives) in the upper elementary grade. Narratives typically contain a story grammar framework (setting, characters, problem, solution, outcome) and tell a narrative about an event, emotions and so forth. Instead, there is a greater focus towards information of facts and detail, that is, expository text. According to the National Center for Education Statistics (2003), students in Grade 4 may have difficulty going from reading and understanding narrative text to reading and understanding expository text. In order to meet the increasing comprehension demands of expository text, it may help to have incorporation of expository text in earlier grades as well. "Neglect of expository texts in these earlier grades may have a large role to play in the declines in reading achievements after the third grade" (Chall, Jacobs, & Baldwin, 1990; Chall & Snow,1988). Expository texts contain factual information that is less concrete (less of the 'here and now') and consists of more unfamiliar vocabulary and information less related to personal experiences. Whereas narratives have a structure around story grammar, expository narratives can have multiple structures (i.e., compare/contrast, problem/solution) (Hall et al. 2005). Making this shift between different text types may be difficult for a student with LLD.

Metalinguistics is the umbrella term that captures semantic, morphological, syntactic and phonological awareness and which refers to the ability to reflect on and talk about language, rather than simply use it (Kamhi, 1987). Phonological awareness has to do with play and manipulation of sounds in words (i.e., rhyming , alliteration) independent of their meaning. Semantic awareness is related to vocabulary and word meaning and awareness that words are symbols because of their arbitrary relationship to referents (e.g., understanding humour that is reliant on awareness that words can have multiple meanings). Morphological awareness refers to individual morphemes and the awareness that words are made up of smaller meaningful units. Syntactic awareness is demonstrated by sentence play (e.g., varying words in sentence forms) as well as being able to make grammatical judgements about the correctness of a sentence. Metalinguistics increases in prevalence in upper grades as the curriculum becomes much more decontextualized and abstract and the child is required to not only use language, but use higher level language skills to talk about language. This, in turn, may make it more difficult for those with LLD. In the SLP Curriculum, metalinguistics will be addressed as a whole, rather than by its components, as the need for specification for the type of metalinguistic awareness affected is less informative than addressing metalinguistics as a whole.

In the original SLP Curriculum, knowledge of basic concepts was identified as important to success in early elementary. Basic concepts are those prepositions, spatial and temporal terms, quantities (e.g., on, above, after, three) and other words that assist in describing the world. The importance of mastering these basic concepts at an early age include the resulting breadth of functional vocabulary that is needed to understand both teacher directions and peer interactions in the classroom (Boehm et al. 1986; Bracken 1986). Mastering these lower level

concepts before Grades 4-6 is critical due to their importance in setting the foundation for early learning (including literacy development). By learning these concepts and setting a foundation of fundamental vocabulary, children are equipped with a set of tools to help them learn to read and comprehend a text. The students also become more effective communicators as they are better able to follow along in conversation and instructions by using their knowledge of basic concepts. Children who have fallen behind in concept knowledge in the younger grades may develop problems with early literacy which in turn can lead to later language difficulties. "Children with special learning needs have significantly bigger gaps in their knowledge of basic concepts and thus, special attention and a focus must be placed in teaching basic concepts to these children" (Boehm et al. 1986). If a student enters Grade 4 with minimal understanding of basic concepts, this should be a priority for intervention as this will continue to slow the child down as the demands increase within the classroom. The student will have trouble following along with the task's verbal or written directions/instructions, let alone begin to demonstrate knowledge in the subject areas.

Vocabulary is important throughout the school years. Children learn most new words without direct teaching; however, this task can be much more difficult for children with language impairments (Brackenbury & Pye, 2005). The evidence shows that these children have problems with keeping new words in short term memory and then with connecting these word forms with the correct meaning (Brackenbury & Pye, 2005). As the curriculum advances, the instructional language becomes more complex. The tiers model of vocabulary breaks words down into 3 steps: the first is comprised of basic, easy or common words; the second tier is for richer words which work on diversifying the lexicon; and the third tier is for topic or content-specific

vocabulary (Beck, McKeown, & Kucan, 2002, cited in Kamhi & Catts, 2012). For example, "walk" would considered a tier 1 word, "stroll" or "strut" belong in tier 2, and "gait" or "ambulation" belong in tier 3. SLPs and teachers need to pay attention to tier 2 vocabulary as it could be easy to assume that the meanings are self-evident or that they can be learned indirectly, when in fact, they are not and may require more direct teaching. Math and science curricula, in particular, are full of vocabulary terms that may be difficult for kids with LLD to comprehend (e.g., "symmetry", "estimating" and "probability").

Language Intervention

Language intervention is crucial to ensure that students with LLD can succeed in school. Unfortunately, services are not as available for older students as they are for younger children. Johnson (2008), a researcher in the United States, reported that speech-language pathologists typically only see children through Grade three. This is problematic as some children are not even identified as having a language disorder until Grade 4 or older, "when they fail to succeed academically in the upper grades" (Larson and McKinley, 2003)

Scott (2010) identified that there is a need to reference the curriculum when providing language intervention services to older students. This helps the SLP to identify where specific breakdowns might be occurring and how intervention services can support that student academically (Scott, 2010). The research for language intervention services for older students is scarce; however, Scott (2010) was able to integrate the available information and identify some general principles that should be used when working with students on informational language. The first is that students should be exposed to modeling of language forms within the context of

their expository discourse tasks, as well as in decontextualized, direct language intervention settings. The second principle is that sentence structures should be practiced in written, expressive and receptive modalities because challenges in one modality does not necessarily mean difficulties in another. The third principle that should guide intervention is that there should be repeated exposure to specific target patterns, as well as many opportunities for the student to practice. The final general principle is that the materials for language intervention should draw from multiple curriculum subject areas. The following quote illustrates exactly how language intervention should look: "[The] dual need - for improved language instruction in the regular curriculum as well as for more specific grammatical instruction for students with LLDs - results in the potential for involvement of the speech-language professional as a key member of the educational team" (Scott, 2010, p. 304). In other words, in order to help the students with LLD to the best of our abilities, the SLP and teacher need to work collaboratively; the traditional "pull-out" model will not be sufficient, especially for older students.

This need for age-appropriate intervention is the driving force behind the extension of the SLP Curriculum to Grades 4 to 6. In order to create an appropriate tool to use with upper grades, an additional glossary ("Other Skills") was added to Hedley's original tool to present curriculum demands and skill areas specific to upper elementary grade levels. Adaptations were also made to the previously termed "Other Language" glossary, which has been renamed to the "Language Skills" glossary. In the following section, these changes will be specifically highlighted and discussed in reference to the before-mentioned increases in curriculum demands.

Methods

Development of the Project

This project is an extension of previous work done by Hedley (2012) which was called "Integrating Language Services and the Alberta Education Curriculum." Hedley's tool was developed to focus on and address the demands found in the classroom for children, particularly those with an LLD, in Grades K-3. The current tool was developed to extend this focus to students in Grades 4-6. Since the current project is an extension of Hedley's previous work, it was logical to use many of the same methods she used for Grades K-3, to structure the continuation that now focused on Grades 4-6. However, there were some differences between the two projects and these differences will be discussed further below.

Description of Current Tool

The tool consists of charts developed for each core subject (Mathematics, Social Studies, English Language Arts, and Science) for each grade (Grades 4, 5, 6). As in the previous project, the charts were developed using Microsoft Word to allow the users of the work to continue to edit the document in order to meet individual needs. The chart has four columns, presenting the main components, which are: "Specific Learning Expectations" (these are as presented in the Alberta Education Programs Study for the core subjects for Grades 4-6), "Key Vocabulary," "Language Skills,"and "Other Skills."

Development of the 3 Components. The "Key Vocabulary" lists tier 2 vocabulary that the child needs to understand and possibly use in order to reach the specific outcome. It was

important to highlight these terms in the SLP curriculum as they may be the basis for difficulties that a child with LLD is experiencing.

The "Language Skills" listed in the charts are defined in the "Language Skills" glossary. Language skills are just as they sound--they are different language areas that are as needed by the student to meet the specific outcome. The "Key Vocabulary," and "Language Skills" in the charts and the "Language Skills" glossary were developed by Hedley in the original project and are described in detail in that document (Hedley, 2012).

The "Other Skills" listed in the charts are defined in the "Other Skills" glossary. "Other Skills" are higher-level cognitive skills that surface in the older grades and that manifest in many of the specific outcomes. The particular skills chosen for this tool were selected using the following approach. Each specific outcome was broken into the series of skills needed to meet the outcome (i.e., a task analysis was performed), and common occurrences of these higher level skills were identified as they appeared in the curriculum. Thus, analysis of the curriculum outcomes in combination with integration of information obtained from research evidence and the class "Language and Literacy" taught by Melissa Skoczylas, led to the selection of the particular "Other Skills."

Now that an overview has been provided in regards to the project layout, the next section will focus on the main difference between the current project and the previous project done by Hedley.

SLP Curriculum: Analysis & Modifications

In order to update the SLP Curriculum, it was necessary to understand what changes occur in the expectations for older students, as outlined above. This section is dedicated to describing how information from the literature review and task analysis of the specific outcomes was used in order to make the tool more applicable to the older grades. The most significant adaptation that was made was the addition of a second glossary titled "Other Skills."

Shift in focus in current project. In the previous work, the specific outcomes were placed into a chart with headings "Key Vocabulary," "Other language" and "Basic Concepts." The current extension focused on "Key Vocabulary," "Language Skills" and "Other Skills." This change is depicted in the charts below.

Table 1

Example of English Language Arts Grade 3 from Hedley, 2012

Specific Outcome Statements:	Key Vocabulary:	Basic Concepts:	Other Language:
-connect prior knowledge and personal experiences with new ideas and information in oral, print and other media texts		-comparison	-narratives -describing -compare/contrast

In Grades K-3, this type of chart made sense because the children need to demonstrate conceptual development to succeed in school (Hedley, 2012). As Hedley mentioned in her paper, Bracken (1998) noted that the acquisition of basic concepts is closely related to general

intelligence and early academic achievement. Thus, it made sense to have "Basic Concepts" as a component of the tool for Grades K-3.

Table 2

Example of English Language Arts Grade 4 from current project

Specific Learner Expectation	Key Vocabulary:	Language Skills:	Other Skills:
Compare new ideas, information and experiences to prior knowledge and experiences	-compare	-comparing/ contrasting -inferences	-personal experience

In Grades 4-6, the the basic concepts section no longer needed to be a focus as these skills were subsumed (i.e., most children have acquired the concepts) in older grades. Even though these skills are not specifically addressed in the older grades, it is important to be aware of basic concepts and their impact on literacy and other academic areas as previously discussed in the paper. The reasoning behind the addition of "Other Skills" in substitution for "Basic Concepts" in this chart came from the literature on executive functions, particularly in children with Language Learning Disorder (LLD). The next section will provide examples of how the incorporation of "Other Skills" addressed the difficulties that older children may face with executive functioning.

Examples showing how "Other Skills Glossary" addresses executive functions. The weaknesses characterized as executive functioning that were listed in this paper may have more

impact in these older grades because the curriculum increases in its complexity and demands to organize and combine large amounts of information (Meltzer, 2007). Thus, in order to address this challenge, the "Other Skills" glossary has been developed to ensure the users of the tool were taking into consideration the effects of weak executive functioning on the higher level cognitive skills embedded within many of the educational outcomes for each subject. Examples of specific outcomes listed within the curriculum for Grades 4-6 that executive functioning weaknesses may appear in the classroom for those with LLD:

Example 1 from Grade 4 Social Studies:

- *4-1 (3) "examine, critically, how geology and paleontology contribute to knowledge of Alberta's physical geography by exploring and reflecting upon the following questions and issues: what geological features make Alberta unique (e.g., hoodoos, Rocky Mountains, foothills, oil sands)?"*

For this specific outcome, the student needs the following executive functions (i.e. higher order cognitive skills from the "Other Skills" glossary): decontextualized language and evaluation. The above outcome has been broken up into the series of steps the child must do to address the outcome. The difficulty many with LLD may experience in some of these steps has been highlighted by identifying the manifested "Other Skill" right below.

- Step 1: Reading complex text (i.e. reading unfamiliar, complex, and non-meaningful information that is most likely from a textbook, expository language).

  Other Skill: "Decontextualized" is indicated because expository text is typically unfamiliar and very fact-based, the learner may not have support from the environment (e.g. classroom supports, or ability to relate using personal experiences) to better access

and understand this information. The information the student must read, learn and apply is thus, heavily decontextualized.

- Step 2: Taking notes (i.e. as one reads the textbook, students take specific notes to later analyze and answer the question; the notes also must be specific to the question).
- Step 3: Generation of ideas (i.e. giving a final written response of what makes Alberta unique; subjectivity of the response requires the student to be able to generate ideas). Other Skill: "Evaluation" is indicated because the student must use information learned from the textbooks and other sources to form a judgement about what makes Alberta unique. The student will not find a word-for-word direct answer anywhere, but rather have to use judgement and known criteria to evaluate and come up with why Alberta is unique.
- Step 4: Retaining Information (i.e., retain information about the geological features of Alberta as well as of other areas outside of Alberta in order to be able to compare/contrast to then decipher what is unique about Alberta).
- Step 5: Completing tasks with written output (i.e., most likely having to submit some form of a written response to achieve this outcome)

Example 2 from the Grade 5 Science curriculum:

- *5-6 (9) "given a design task and appropriate materials, invent and construct an electrical device that meets the task requirements."*

For this example, the student would need the following executive functions: brainstorming and procedure. The above outcome has been broken up into the series of steps the child must do to

address the outcome. The difficulty many with LLD may experience in some of these steps has been highlighted by identifying the manifested "Other Skill" right below.

- Step 1: Planning projects (i.e. plan what can be made given the requirements and materials as well as how it will be made).

  Other Skill: "Brainstorming" is indicated because the student has to come up with various ideas on how to create this device using a design task and appropriate materials. The final plan will most likely not occur instantly and instead, require the student to generate multiple ideas on the possible device.
- Step 2: Estimating length of time needed for school-work (i.e. time needed to invent and construct this electrical device by the deadline).
- Step 3: Completing coursework (i.e. creating this electrical device by the deadline and making sure all the requirements have been met).

  Other Skill: "Procedure" is indicated because the student is required to follow step-by-step directions in a particular order to meet the specific outcome.
- Step 4: Presenting product of task in meaningful way (i.e. in this case, presenting an electrical device).

By deconstructing each outcome into its "Other Skills" as done in this current project, the tool highlights the role of executive functioning in achieving different curriculum outcomes in different subjects. By doing so, the tool supports users in identifying tasks that may challenge students with LLD, including executive functions that may be impacted. With this information, the next step would be intervention and/or other supports to address areas of weakness.

Example 3 from the Grade 4 Language Arts curriculum:

- *2-1 (2) "comprehend new ideas and information by responding personally and discussing ideas with others."*

The specific outcome has been split into a series of steps needed to accomplish the above outcome to better demonstrate the complexity in the demands and skills required to complete it. Areas a child with LLD may experience particular difficulty with (due to executive functioning deficits) have been underlined:

1. Decoding and Synthesizing: those with LLD have difficulty decoding accurately and synthesizing to make meaning of what's being read
2. Make meaning: draw on prior knowledge; requires cognitive flexibility to jump from retrieving and interpreting prior knowledge to focus and interpret new content. Requires integration of old and new information.
3. Draw inferences/conclusions: requires flexibility of thinking; requires student to prioritize information in order to make text useful for answering a question.

The above are some of many illustrations of areas of difficulty students with LLD may encounter in school and how the tool is designed to bring potential difficulties with executive functioning into awareness by highlighting the "Other Skills." Although individuals with LLD may experience difficulties with a wide variety of higher-level cognitive skills, this "Other Skills" glossary is not comprehensive and focuses on only those most relevant for collaboration between the teachers and the SLP. Some of these more relevant higher-level cognitive skills include ability to understand and use macrostructure to organize information (i.e. hierarchy of

organization), evaluation, and ability to use personal experiences and critical thinking to guide decision making. One of these relevant "Other Skills," hierarchy of organization, will be highlighted in the examples below along with other specific changes made to the tool in comparison to the previous project (Hedley, 2012).

Examples Showing Other Skills Manifested in Curriculum

Using resources. Using resources is one higher level skills listed under the "Other Skills" glossary. Such is the case for the following outcome from the Grade 4 Language Arts curriculum:

- *1-1 (5) "selecting preferred forms from a variety of oral, print and other media texts."* Using a step-by-step approach, the child first needs to be able to identify what resources are available to choose from, followed by appropriate navigation of these resources to identify personal likes and dislikes of each. In order to make this judgment and determine likes and dislikes, the child needs to set some criteria in their mind for what determines a preferred and nonpreferred resource; this is where the cognitive skill evaluation also ties in with the skill of using resources for this learning outcome.

Another example of using resources is for the following outcome from the Grade 4 Language Arts Curriculum:

- *2-1 (2) "explaining how the organizational structure of oral, print and other media texts can assist in constructing and confirming meaning."*

Once again, first the child needs to identify the different resources available to them (i.e., different oral, print and other media texts). Then, the child needs to efficiently navigate these

resources by determining how each resource is organized. For example, a print text such as a textbook contains a table of contents at the front. Each chapter has a particular area of focus and the child needs to be able to use the table of contents to flip to the appropriate section. Once they navigate to the right chapter, they have to understand the organization of that chapter. The chapter title is the main focus of the chapter and any further subtitles narrow that broad focus into appropriate categories. Then, they have to understand that the text underneath those subtitles are organized to provide explanations and descriptions for that category of information. Understanding this organization thus, requires an additional higher level skill, "hierarchy of organization" to understand this superordinate and subordinate piece. Once the child has a grasp on how each different resource is organized, he or she then needs to determine how this will create and verify meaning in their work. These are a few examples of how the higher level skill, using resources, looks in the Alberta curriculum. In each of these examples, one can quickly notice how weak executive functioning will have a significant impact on achieving each of these learner outcomes.

Hierarchy of organization. Hierarchy of organization is one of the more relevant skills for both teachers and SLPs in the "Other Skills" glossary. Such is the case for the following outcome from the Grade 4 Language Arts curriculum:

- *2-1 (1) "explain how the organizational structure of oral, print and other media texts can assist in constructing and confirming meaning."*

The above example requires the student to use the skill hierarchy of organization from the "Other Skills" glossary because the student must use the structural pattern of various media (oral, print, etc.) to construct and validate meaning. Therefore, the student must use organizational cues such

as headings, subheadings, and titles to enhance their understanding and meet this specific outcome in the curriculum, which is as noted earlier known to be challenging for those with LLD.

Semantic networks and their relevance to academic skills. As mentioned previously in the paper, efficient semantic networks become integral to meeting the increasing demands of the mid-upper elementary grades. Awareness that weak semantic representations can be an underlying factor and cause for many difficulties in achieving outcomes in school is important for planning lessons and interventions to best address the child's needs. Users of the tool can do this by noticing what outcomes in the curriculum the child is struggling with, what "Other Skills" have been listed for that outcome, and how inefficient semantic networks might play a role on the challenges experienced.

Example 1:

The effect of inefficient semantic networks on the higher level cognitive skill of evaluation from the Grade 4 Language Arts curriculum:

- *2-1 (2) "monitor understanding by confirming or revising inferences and predictions based on information in text."*

To achieve this outcome, the student must demonstrate the "Other Skill" of evaluation because the student must use known information and criteria to assess and make a judgement in regards to their level of understanding. However, in order to use known information and apply it to a new situation, one must have adequate semantic networks to be able to activate and retrieve these previous representations while simultaneously, creating a new representation. Therefore, evaluation becomes increasingly hard for those with LLD, and being able to link back these

higher level skills to possible weak semantic representations will allow the users of the tool to better understand the root of the difficulties.

Example 2:

The effect of inefficient semantic networks on the higher level cognitive skill of brainstorming from the Grade 4 Language Arts curriculum:

- *1-2 (4) "explore ways to find additional ideas and information to extend meanings."*

To achieve this outcome, the student must demonstrate the "Other skill" of brainstorming because the student has to generate multiple ideas about a given topic and this involves semantic knowledge and making links to previous knowledge. However, if as previously mentioned, the student with LLD is having much faster decay of unfamiliar words, it is increasingly difficult for them to make connections between these weak new representations and previous representations. And with weak semantic networks, the child has less opportunity to make connections in the first place.

Both examples demonstrate how weak semantic representations can manifest in the curriculum outcomes and how awareness of these effects can be used to best support the child.

Adaptations to Language Skills Glossary

Another adaptation that was made to the SLP Curriculum was to adjust definitions and add concepts to Hedley's "Other Language" glossary (which has been renamed the "Language Skills" glossary). Again, these changes were made in order to better capture the needs of students with LLD in upper elementary grades.

Specific changes to language skills. The first modification to this glossary was the inclusion of additional language skills including: *explaining, identifying, metalinguistic awareness, text structure, figurative* and *decontextualized*.

An example from Grade 4 Language Arts is provided to show how two (metalinguistic awareness, and explaining) of the six additional skills manifest in the specific outcome:

- *2-2 (3) "explain how onomatopoeia and alliteration are used to create mental images."*

Metalinguistic awareness is a skill needed for this outcome because the student does not only have to know the meaning of words as well as the sounds that comprise them in this situation, but also use this semantic and phonological knowledge to determine how onomatopoeia and alliteration work to create a mental image. Explaining is a skill in this outcome for more obvious reasons as the student must explain to the teacher and/or class in a logical manner that would make sense to everyone else even though they cannot necessarily see what the student is experiencing.

Secondly, modifications were also made to a number of the existing glossary definitions. Expository text was removed as an individual entry and instead, falls under text structures. One skill in particular, procedure, was moved from "Language Skills" to the "Other Skills" glossary. It was deemed more appropriate in this glossary because the task engages various cognitive skills. To reflect change for older elementary students, the definition of 'Inferences' has been expanded to include the following: "This skill also requires that the student make connections and links between things (e.g., how X contributes to or is a part of Y) that may not be obviously connected. Inferencing skills are further required when making predictions based on explicitly stated information." Thus, in the current edition of the SLP Curriculum for Grades 4-6

"Inferences" has been used to designate all instances in which a student is required to make connections as part of a curriculum objective.

The last modification involved collapsing some of the previous definitions to fall under one umbrella term. Phonological, semantic, syntactic, and morphological awareness are now under the skill called metalinguistics. In the previous project, phonological awareness was listed as an individual language area. In order to demonstrate the link for both teachers and SLPs between the types of awareness and the overall definition of metalinguistics, specification of each awareness type has been made previously in the paper and in the glossary. However, the different types of metalinguistic awareness are not listed separately in the charts. Narratives and expository text are also under text structures as opposed to having separate entries for both as done in the previous project. This is because even though narratives and expository text contain different structural patterns, they both are a form of text structure and to make the distinction between the two in the older grades is not as important aside from its purpose of structuring information in a certain way.

Directions for Use

Extending Hedley's existing tool to include Grades 4-6 allows for the continued collaboration between teachers and SLPs in mid-upper elementary grades. Please refer to "Integrating Language Services and the Alberta Education Curriculum" (Hedley, 2012) for a detailed account on how different professionals and members of a student's clinical team can utilize the tool to maximize efficiency.

Conclusion

Today's educational policies in Alberta support collaborative service delivery as means of supporting students within the inclusive classroom setting. While all students stand to benefit from collaboration between teachers and SLPs, these supports are particularly important for students with LLD. Without appropriate supports within the inclusive classroom, these students' academic and social achievements may be jeopardized (Hedley, 2012). The SLP Curriculum tool can be used to support interprofessional collaboration between teachers and SLPs, as well as to enhance the educational experience of students with LLD.

As students transition into upper elementary grades, they are immersed in increasingly complex language environments, and faced with greater curriculum demands. In order to best support older elementary students with LLD, the current SLP Curriculum extends the existing framework to include the complex skills (language and otherwise) that manifest within the learner expectations for Grades 4 to 6. As with the original SLP Curriculum, it is important that teachers and SLPs recognize that using the current tool requires time to comprehend, and practice, before it may be used to its full potential. Additionally, school administrators must support teachers and SLPs in their collaborative efforts by providing these professionals with quality meeting time (Hedley, 2012). Taking these steps will enable teachers and SLPs to deliver effective services to students with communication needs within the context of the mainstream classroom.

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