A Framework for Supporting Students with Learning Disabilities in Spanish Courses: Connecting Learning Characteristics and Instructional Methods

Joshua B. Tolbert
Huron High School, USA

Kim Killu
University of Michigan-Dearborn, USA

Belinda Davis Lazarus
University of Michigan-Dearborn, USA

Abstract—**Students with learning disabilities are characterized by highly individualized dysfunction of the central nervous system. Current research has suggested that the learning difficulties experienced may be attributable to processing difficulties in working memory, attention, information retrieval, and phonological processing. In educational environments, students with learning disabilities often struggle to meet the demands of the general curriculum and require support or intervention to reveal their potential. Because the demands of learning an unfamiliar language can expose weaknesses and heighten anxiety, individuals with learning disabilities have often avoided or been discouraged from foreign language study. However, research conducted on the use of multi-sensory approaches has indicated that such instruction can help students with learning disabilities to succeed in learning Spanish. A discussion of the relationship between neurological research and multi-sensory teaching provides implications for persons with learning disabilities experiencing meaningful inclusion in Spanish courses. Application of research and associated theory to practice is expressed in the form of examples of general accommodations, existing resources, and learning strategies which provide a framework for students with LD to have positive experiences in Spanish.**

Index Terms—**multi-sensory, foreign language instruction, learning disabilities, working memory, Spanish vocabulary**

I. CHARACTERISTICS OF LEARNING DISABILITIES AND FOREIGN LANGUAGE CHALLENGES

Individuals identified as having learning disabilities (LD) often experience difficulties related to language, resulting from central nervous system (CNS) dysfunction. This atypical operation of the CNS makes it especially challenging for students with LD to succeed with reading, math, and the oral or written expression of language. In addition to the obstacles which exist for established content areas, students with LD often experience added difficulty in learning a non-English language. The following paper will discuss the difficulties faced by students with LD, and the current state of research on how such difficulties may derive from CNS dysfunction. Additionally, the relationship between common challenges of LD students and successful learning with multi-sensory instruction will be considered. Finally, practical examples of accommodations, resources, and learning strategies for multi-sensory Spanish instruction will be offered.

A. Learning Disabilities and the Central Nervous System

The role of language is pivotal to understanding learning disabilities, as language has become central to human expression, experiences, and endeavors of learning. A CNS dysfunction has been a consistent element in describing learning disabilities, with the Individuals with Disabilities Education Improvement Act (IDEA) defining a specific learning disability as "a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written" (IDEA Regulations, 34 C.F.R., §300.8[c][10]). Students with LD usually encounter early challenges in acquiring their native languages, and often struggle with multiple content areas in the general curriculum (Byrnes & Wasik, 2009). Wilson and Swanson (2001) concluded that difficulties with working memory and processing were characteristic of students with learning disabilities. Appropriately, interventions and compensatory strategies for individuals with LD typically include explicit and systematic methods which provide ample and deliberate repetition, minimize distracting stimuli, isolate critical content, and present a rationale for material to be studied (Archer & Hughes, 2011).

B. Learning Disabilities and Foreign Language Difficulties

While existing learning strategies have contributed to heightened success for students with LD in the general curriculum, foreign language study has been more problematic. Levine (1987) remarked that foreign language study was the discipline most likely to create anxiety in individuals with LD. Barr (1993) indicated that success would be elusive beyond introductory levels, while Scott and Manglitz (1997) posited that difficulties experienced in English would also exist in second language learning. Simon's (2000) personal account corroborated claims about anxiety and first-language difficulties affecting the learning of a new language, as well as detailing the importance of both students and instructors examining and considering numerous facets of LD which necessitate strategies to promote student success. Ehrman (1996) noted the importance of simultaneous processing and mental shifts in second language learning, operations which are understandably difficult for individuals with atypical CNS functioning.

The challenges faced by students with LD in learning a non-English language have prompted waivers, reduced syllabi, and departures from traditional teaching as accommodations (Amend, Whitney, Messuri, and Furukawa, 2009; Duvall, 2006). Although Shaw (1999) emphasized that a minority of students with LD inevitably would not be well-suited to foreign language study required by many universities and college prep programs, it was deemed imperative to include the remaining majority of students with LD who could find success when provided with accommodations and strategies which recognized their educational needs and neurological functioning. Despite accounts detailing how students with LD often struggle to process new information, and despite the increasing expectation for high school students in the U.S. to earn credits in non-English languages for a diploma (National State Council of Supervisors for Languages, 2012), there is a deficit in both research and practice dedicated to supporting students with LD in learning a second language.

C. Multi-sensory Approaches

The concept of multi-sensory instruction may be considered vital to the success of students with LD in any academic discipline, including foreign language study, and merits consideration in constructing a framework for supporting struggling learners. Sparks and Ganschow (1993) determined that a multi-sensory approach to teaching phonological skills improved the phonemic awareness of students in both Spanish and English. Further research has centered on multi-sensory instruction incorporating explicit phonological teaching (Ganschow & Sparks, 1995), and a two-year study of at-risk students indicated that a multi-sensory approach promoted performance comparable to peers instructed with traditional methods (Sparks et al., 1998). Because of demands in working memory and diverse functioning of the CNS which can affect second language learning (Kormos & Safar, 2008; Palladino & Cornoldi, 2004), multi-sensory approaches have been promoted by Dal (2008) and Sousa (2001) and supported by the research of Amend et al. (2009).

Multi-sensory learning experiences are often vital to success for LD students, and have gained traction as contributing to memory and efficient learning for a wide array of students. Medina (2008) unequivocally endorsed the use of multi-sensory presentation, citing research in which experimental groups in multisensory environments consistently experienced stronger problem solving and more enduring retention of information. Moreno and Mayer (2007) examined the effects of interactive multimodal environments upon learning outcomes, by pairing verbal and visual representations of content which relied upon the actions of learners. The basic premise of interactive, multimodal learning relies on a cognitive-affective model in which varied information sources are selected, with the intention of being processed by the student's working memory, creating a more elaborate model in partial conjunction with knowledge stored in long-term memory (Moreno & Mayer, 2007). Medina (2008) was emphatic about both attention and memory in relationship to engaging the senses, as "The more elaborately we encode a memory during its initial moments, the stronger it will be" (p. 119).

Elaborate experiences and repetition are crucial to storage of new information, and to the mental process of associating new input with previous knowledge through meaningful repetition of information and patterns (Gass & Selinker, 2001). Multi-sensory approaches are often indispensable to persons with LD in experiencing success in the standard curriculum. Additionally, several studies have explored the use of multi-sensory structured language (MSL) practices in Spanish courses, demonstrating that at-risk and LD students could complete course requirements and develop language skills (Ganschow & Sparks, 1995; Sparks & Miller, 2000). Sparks and Miller (2000) summarized this body of research by asserting that multi-sensory instruction which systematically and explicitly used both English and Spanish could lead to significant gains in both native language and foreign language (FL) proficiency. Further, in implementing a multi-sensory approach to learning basic Spanish, Sparks and Miller (2000) found that at-risk students and students with LD can pass introductory foreign language classes and attain proficiency.

D. Application to Practice

By definition, students with LD possess the intellectual capacity to succeed in the general education curriculum. However, the aforementioned CNS dysfunction has made it essential for further resources, accommodations, and strategies to be available in a given content area. Although comparatively limited attention has been paid to the inclusion of LD students in foreign language courses, practical suggestions can be extracted from the existing body of research regarding how classroom instruction might better address their needs.

In consideration of these unique needs, general suggestions for accommodations and resources will be presented, followed by specific examples of learning strategies for students learning Spanish. Although some of the information

may be incorporated into the teaching of a variety of languages, the focus of this discussion will be the teaching of Spanish to students with LD whose native language is English. One reason for this is that a good deal of existing literature pertains to Spanish instruction, and may not directly apply to other languages. The utility and ubiquity of Spanish for U.S. students with LD is also notable, as Spanish is the most commonly spoken household language in the nation, for both native and non-native speakers (Gonzalez-Barrera & Lopez, 2013). Further, Spanish is overwhelmingly the language with the largest enrollment in U.S. K-12 institutions (Rhodes & Pufahl, 2009), and in U.S. postsecondary institutions (Furman, Goldberg, & Lusin, 2010).

II. GENERAL ACCOMMODATIONS

Drawing upon definitions of accommodations provided by McLaughlin (2009) and IDEA Regulations (2006), accommodations are alterations to how the curriculum is presented to a student, but not fundamentally an alteration of the curriculum itself. By design, a multi-sensory Spanish framework for students with LD conceptualizes instruction in direct consideration of CNS functioning that is likely to make a traditional course of study more difficult. These accommodations are best understood as more general opportunities which may be offered to a student, in conjunction with specific resources and learning strategies.

A. Alternate Locations

A common accommodation for LD Students is to allow for testing or instruction to occur in a separate room, either individually or in small groups. Although an admitted flaw with this accommodation may be the temporary removal or alienation from the general classroom, there are cases in which temporary changes of venue can be legitimately beneficial. For students who are struggling with material or concentration, or in need of another location for a multi-sensory activity, this accommodation could be considered appropriate.

Importantly, Medina (2008) advised the creation a designated space specifically for studying Spanish, which would include relevant resources and artifacts, and focus only on Spanish (Medina, 2008). Medina (2008) further asserted that environment plays a significant role in both encoding of information and recall, meaning that consistency of locations and methods for instruction and assessment can contribute to effective practice. Because elaborate learning events (Moreno & Mayer, 2007) and deliberate organization (Archer & Hughes, 2011) can contribute to memory and retrieval, a designated space for both learning activities and assessment is worth considering.

B. Advanced Organizers

Archer and Hughes (2011) provided examples of giving students information in advance. This accommodation could involve distributing copies of materials prior to explicitly instructing, or previewing and describing an upcoming lesson or activity. Part of the rationale for this practice is to allow students extra time to absorb content, and to mentally organize information. However, materials and information shared with students with LD should also reflect the structure of a multi-sensory approach. Merely providing a student with oral descriptions or paragraphs of text ahead of formal instruction is not likely to provide meaningful support. Whenever possible, LD students should be provided high-interest, participatory resources, which prompt students to visualize, act out processes, or ask questions.

A neurological basis for this sort of priming of the brain may also exist. Willis (2008) cited recent neurological research, most notably Coles (2004) which indicated that new information or connections in the brain require the communication of both hemispheres. As a result, categorical connections appear to form, and information which enters working memory is more likely to be stored or processed –particularly in tasks like reading- if the information can link with existing information or categories (Willis, 2008). The deliberate sequencing of instruction promoted by Archer and Hughes (2011), along with the graphic organizing strategies described by Lazarus (1996) might also be described as facilitating this mental process in physical form. When the brain does not recognize a category or referent for new information, it may have to create a new category, which likely absorbs more working memory capacity, making encoding more difficult. For students already experiencing dysfunction of the CNS and difficulty in learning, accommodations which can provide background knowledge may be especially important, especially when faced with unfamiliar words or concepts in Spanish.

C. Reduced Cognitive Loads

It cannot be emphasized enough that students with LD possess average or greater intelligence, but are stymied by innately individualized dysfunctions of the CNS. Neurological disharmony may impact the central executive (Kibby et al., 2004) and working memory (Willis, 2008), and is believed to contribute to challenges with attention, organization, and recall. The relationship of cognitive challenges to learning informed the explicit instruction model of Archer and Hughes (2011), which requires identifying and presenting critical information, and deliberately explaining and demonstrating procedures and concepts.

A related accommodation is to break long tasks into more, shorter parts, or to concentrate on fewer problems for practice or homework. This accommodation may directly benefit students with LD by not overloading working memory; it is conducive to mastery, may reduce anxiety, and can be coupled with elaborate multi-sensory experiences to promote retention (Medina, 2008; Moreno & Mayer, 2007). Mercer et al. (2011) stated that simplifying texts allows a consistent

sense of closure, and requires shortened sentences and basic words with a limited number of syllables. This practice fits neatly with an exploratory or introductory Spanish program, which would inherently involve basic words and phrases, as well as favoring expressions in the present tense, as also suggested by Mercer et al. (2011). In essence, reducing cognitive demands would appropriately facilitate a focus on learning and mastering a few words or concepts at a time through multi-sensory methods, rather than covering more material than students with learning disabilities might otherwise learn and remember.

D. Extended Time

As discussed, the increased demands of neural processing, and accompanying challenges faced by persons with learning disabilities make considerations about presentation of material appropriate and necessary. No remotely reasonable person would expect a student with a physical disability to run a four-minute mile, nor should a person with a dysfunctional central nervous system be expected to somehow process 20 new vocabulary words in a class period. Accommodations for any student with a disability reflect his or her particular difficulties, and are intended to minimize those challenges so that optimal learning can transpire. Because individuals with LD face unique neurological challenges, reducing cognitive demands with shortened activities, emphasis on crucial material, and previews of information can be beneficial.

Another form of additional time was described by Swanson (2012), who indicated that students who are facing additional processing demands may require slightly more time to respond, and can benefit from instructors who are mindful of not rushing and discouraging students. In conjunction with reduced cognitive demands and shorter assignments, students with LD can also be given extended time for assignments, assessment, or breaks. Another interpretation of extended time might simply be that more time is devoted to a concept or segment of instruction. Research involving response cards has demonstrated that increased opportunities to provide answers has increased engagement and decreased academic and behavioral difficulties (Gardner, Heward, & Grossi, 1994; Lambert, Cartledge, Heward, & Ya-yu, 2006). This notion of expanded or extended time aligns well with a multi-sensory approach to Spanish instruction, as more time spent on a particular sound or concept with a variety of sensory inputs and expressions is more conducive to both encoding and recalling information.

III. IMPLEMENTING EXISTING INSTRUCTIONAL RESOURCES

As with accommodations, instructional resources are closely linked with strategies, and often selected in relation to assessments of individual needs and progress. Similar to the accommodations and strategies which also constitute a framework for supporting students with LD in Spanish learning, student responsiveness of the student to a resource often provides an indication of whether to continue with an approach or incorporate others. Examples of existing resources and their uses are provided here with the intention of providing options which may be used to determine and address the needs of individual students.

A. Graphic Organizers and Visual Displays

Visual materials can contribute to Spanish learning both as another representation of vocabulary and content, and also as a tool for organizing and displaying the relationships between concepts. Kleinert, Cloyd, Rego, and Gibson (2007) asserted that graphic organizers are most effective when reflecting manageable amounts of material and when organizing vocabulary into categories which facilitate acquisition. Duvall (2006) similarly promoted the use of graphic organizers and visual aids to make content accessible to students with LD.

Depending upon the level of study, and the needs of learners, these visual materials could serve different purposes. For elementary or intermediate students, categorical lists of nouns like those described by Klienert et al. (2007) could take the form of visual references in a classroom, created by either instructors or students. For secondary students, visual resources may be used to practice more complex material, like the gendering or pluralizing of Spanish nouns. At more advanced levels of study, illustrations of the process of conjugating Spanish verbs can provide practice with fundamentals of the language and metacognition. The preceding examples have the potential to be done on paper or with electronic resources, such as Glogster (edu.glogster.com). An instructor-created electronic resource has the benefit of being readily available online and in a format familiar to contemporary students. In consideration of Medina's (2008) assertions about immersive experiences and learning, both paper and electronic methods may benefit students, so long as they are engaged and receiving timely feedback from an instructor when it is needed.

B. Multimedia Reading Materials

A read-along method, in which students are simultaneously presented with a story and an accompanying audio recording, is often beneficial for LD students. This is especially appropriate for individual students, with the option of using headphones, and could also feasibly be employed with small groups of students using the same ability-matched text. The pairing of audio elements with printed words already exists in commercially-available materials, such as the Spanish-language versions of children's books which are bundled with audio recordings offered by School Specialty (2012).

The increasing presence of technology in education may afford more numerous options in multimedia texts, including resources in Spanish. Reading is Fundamental (2012) has presented freely accessible Spanish read-along electronic books (e-books), *Rebota* and *Las hormigas negras y rojas*. Notable features of these texts include highlighting words in red as the narrator reads them, allowing the reader to navigate back and forth between pages, and giving the reader control over pausing and playing the audio. Essentially, it constitutes an animated resource, similar to those Moreno and Mayer (2002) indicated to be effective for memory encoding and successful learning.

C. Multi-sensory Cards for Phonics and Vocabulary

Kleinert et al. (2007) indicated that color-coded phonics cards are particularly useful for supporting students who are struggling with decoding. Different varieties of phonics cards could be used to assist students in practicing phonics, and to promote mastery of vowels through multi-sensory experiences. For example, a different color could be associated with each of the five vowels, and every time the vowel is printed or represented, this color could be represented. If, as Kleinert et al. (2007) recommended, students construct their own vocabulary cards, this system of color-coding could be incorporated into the process. The presentation of vowel and consonant pairings could also follow this pattern, as well as the process of introducing one consonant at a time and demonstrating combinations with all five vowels (Sparks & Miller, 2000). A notable feature of the Spanish language is its phonetic friendliness; for example, all the vowels have essentially a consistent pronunciation. Unlike English, in which learning words by sight is appropriate, explicit instruction in Spanish phonics can provide a foundation for correct pronunciation and early confidence and comfort.

In addition to the color-coded vowels, an electronic presentation of phonics could include audio pronunciations, animation, and tactile components (e.g., drawing the shapes of letters, tangible letter shapes which could be manipulated) to encode more elaborately the experiences and promote phonological awareness. Because the rules of grammar and pronunciation in Spanish follow rules which are not familiar to native English speakers, a more immersive process can be more engaging. As noted by Simon (2000), students with LD may benefit from learning opportunities which create more engagement and minimize anxiety, as well as helping to focus on learning the intricacies of a language rather than fixating on how it differs from English.

D. Software for Reading and Recording

Previously, examples were provided of electronic reading materials, such as e-books, which could be considered forms of assistive technology. For instance, the voice-recognition software utilized in a study by Kartal (2006) promoted student practice with language and metacognition. Technology of this variety typically requires students to speak into a microphone and then reproduces their speech as digital audio. Although this process has understandable utility for providing language practice to students with disabilities, it likely depends on English being the primary language of both the speaker and the software. Along with voice-recognition software, technological options such as Google Translate, the Kurzweil Reading Program, and audio capturing software may be beneficial to students with learning disabilities.

In addition to software to read text aloud or to capture and reproduce speech, other technological resources may be useful to students with LD in a basic Spanish curriculum. One example is Audacity, a free and streamlined interface for recording and editing sound which provides a graphic interface using familiar symbols for functions like recording, playing, pausing, or stopping audio. Audacity shares with other recording software the convention of visually displaying audio by depicting waveforms. Conceivably, the experience of capturing and manipulating audio events could engage students, as well as convey elements of rhythm, segmenting, and pausing that relate to phonology and spoken language.

For a student with LD, a resource like Audacity can be applied to Spanish learning in several ways. First, it could be used by a student to record a lesson. Recording lessons can benefit students who struggle with reading, likely compensating for some of the demands of working memory explored by Wilson and Swanson (2001). Further, Audacity can be employed by foreign language instructors as a means of both facilitating language practice and gathering data for assessment. The technology could be used by individual students (ideally with headsets) to record short responses or passages, or by small groups of students recording dialogs. By recording audio, instructors can compile a record of performances that can be analyzed to assess progress. Recordings allow instructors to identify patterns and to determine material for re-teaching, and can also provide students with a virtual portfolio from which to examine their progress. The practice of technologically-based self-reflection was supported by the findings of Kartal (2006), indicating potential gains in language and greater comprehension of learning processes.

IV. LEARNING STRATEGIES

Because of the challenges faced by students with LD, detailed assessments of individual needs and abilities can indicate which resources, accommodations, and strategies are essential in supporting students to reach their potential. Although there still exists a need to develop further research-based strategies to support students with LD in learning Spanish, existing learning strategies can be implemented. The strategies described below have been included on the basis of being documented in the literature of at least one of the relevant fields, namely Spanish instruction or learning disabilities. Descriptions of implementation and age appropriateness are presented for each strategy.

A. Games

Games have been evidenced to be engaging and effective components of instruction designed to involve students in learning English (Topping & Ferguson, 2005) and Spanish (Guebert, 1991; Herrera, Lorenzo, Defior, Fernandez-Smith, & Costa-Giomi, 2011). In some cases, the same basic game may be used in either language. For example, Guebert (1991) reported the successful use of baseball, both as a theme to focus student interest, and in the form of a vocabulary-based game to help students practice the language. One example of this game organized Spanish vocabulary words into four lists, representing bases, and competing students advanced bases or played defense by providing correct responses (Guebert, 1991). Mercer et al. (2011) described essentially the same game as an instructional game to help students with disabilities improve in reading by using pronunciation of words from flash cards to score points, with the class divided into teams for competition.

This game could be used as part of a multi-sensory strategy for teaching basic Spanish, as it increases engagement, requires active attention, and involves movement, sound, and vision. Although Spanish-language baseball could potentially be used at any level of K-12 instruction, elementary students are likely to benefit most. The use of the game to teach basic vocabulary is developmentally appropriate for elementary students, as is an added opportunity to practice with motor skills and following procedures.

B. Incorporating Music

Music can be a powerful teaching tool, and has been found to improve phonological awareness in both students' native and non-native languages (Herrera et al., 2011). The study of music has been suggested to be naturally multi-sensory and accessible to students with LD, as both presentation of information and student practice may depend on combinations of auditory, visual, and kinesthetic functions (Darrow, 2012). Swanson (2012) supported the use of a multi-sensory approach, recommending color-coding and other visual cues to accompany musical activities, largely as a means to support memory. Providing both visual and auditory information in the fashion described by Swanson (2012) has been suggested to be mutually reinforcing, as the combination of different modalities promotes stronger comprehension and memory (Moreno & Mayer, 2002). This multi-sensory approach was also understood to involve accommodations appropriate to students with LD, such as providing longer "wait time" for student answers, and the strategy of establishing and maintaining a routine for instruction (Swanson, 2012).

The use of music to enhance foreign language learning has also been documented in existing literature. Dever (2008) promoted the use of Spanish songs, along with poetry and proverbs, as part deepening students' comprehension and appreciation of language, beyond literal translation of words. Richer experiences with language are intellectually and emotionally engaging, and have the practical benefit of motivating students to actually move their tongues, and to practice hearing and producing sounds (Dever, 2008). The engagement of multiple senses also has implications for learning and memory, by providing more absorbing experiences; such experiences have been shown to enhance storage and recall of information (Medina, 2008). While acknowledging the rhythmic differences between English and other languages, Tuan and An (2010) noted the value of using songs to provide simple, meaningful contexts and experience with syllables. The nature of lyrical music inherently and implicitly creates an accessible hybrid of linguistic and quantitative elements, which supports language acquisition and psychological development (Tuan & An, 2010). As part of a multi-sensory approach, the incorporation of music can provide persons with disabilities with heightened engagement and an alternative way to acquire information.

As with games, music can be incorporated at any level of K-12 education. Songs which more explicitly teach basic vocabulary, such as colors and nouns, are more appropriate for elementary students. Older students may prefer musical experiences which incorporate popular songs in Spanish. One example of this is providing students with a copy of lyrics with selected words removed, and having them listen carefully to the song two or three times in order to fill in the missing lyrics. A helpful variation is to provide a word bank for students who have been frustrated after an independent opportunity to identify the missing words.

C. Using Both Music and Games

As a way to develop phonological awareness, Herrera et al. (2011) used a combination of music and games with children whose first language was either Spanish or Tamazight. Musical activities involved in the study were found to improve phonological awareness and naming speed (Herrera et al., 2011). Notably, the phonological interventions provided in the Herrera et al. (2011) study improved children's phonological awareness and accelerated the recall of words stored in the long-term memory. Because of neurological research concentrating on phonological processes (Blumstein, Burton, & Small, 2000) and investigations into elaborate experiences promoting memory (Medina, 2008; Moreno & Mayer, 2007), multisensory games like those used by Herrera et al. (2011) have a basis for use with struggling learners.

As with music and games used independently, a combination of both is likely most appropriate for elementary students. The familiarity of these activities, and possible student preference, may be higher for younger children. Additionally, though learning Spanish phonology is an important part of learning the language at any age, this particular approach is more appropriate for engaging younger students.

D. Movement-based Learning

Kleinert et al. (2007) generally endorsed a movement-based model of foreign language instruction as a way to increase interaction, meaning, and relevance. Total Physical Response (TPR) was a movement-based approach developed and researched by James Asher to promote second language learning (Wolfe & Jones, 1982), and is still consistent with contemporary understanding of learning and memory (Kennedy, 2006). Amend et al. (2009) noted TPR to be one method which could be conducive to teaching vocabulary and grammar to students with LD.

A specific example of how this strategy might be used to provide basic Spanish instruction would be adapting the game "Simon Says" to Spanish phrasing and vocabulary for body parts, which can permit practice with attending to directions or eventual practice with the language as students lead the rest of the class through "Simon Says" (Celestino, 1993; Kleinert et al., 2007). Celestino (1993) observed that TPR connected students with language, while noting that TPR leaned toward the use of commands. However, Celestino (1993) was careful to emphasize that the use of commands in TPR can empower students by providing a means for participation in larger classroom settings. Further, because TPR is so closely linked to imperatives, it can be used indirectly as a means to teach students procedures and to perform other tasks and activities involved in the Spanish classroom (Glisan, 1986). This sentiment of empowerment and participation is especially resonant for educators serving students with LD.

While movement-based learning can be implemented at all levels, this component of a multi-sensory Spanish framework is also better suited to elementary students. The general importance of motor skill development for younger students cannot be understated, and the emphasis on imperatives and procedures described by Celestino (1993) and Glisan (1986) is particularly appropriate for students in the earlier grades who may benefit from more explicit practice with procedures and classroom behavior.

E. Guided Visual Vocabulary Practice

Guided Visual Vocabulary Practice (GVVP) is a multi-sensory strategy designed to encourage students to connect concrete Spanish nouns to their English equivalents. A GVVP template consists of six spaces which should ultimately contain three elements: a Spanish noun, an illustration, and the related English noun. When presented to the student, one of the three elements is missing. The student is explicitly guided to create an illustration or to provide a missing word. Spanish nouns are written and practiced by syllables, while English nouns are spelled out one letter at a time.

GVVP was developed to promote a more elaborate experience conducive to memory and retention (Medina, 2008) and to present new vocabulary in thematic groups, as opposed to superficial recognition (Folse, 2004). An individual GVVP template bears similarity to the vocabulary squares employed by Hopkins and Bean (1998) and associative approaches like the keyword method (Raugh & Atkinson, 1975), but with a more visual and explicit nature. The guided format of GVVP was intended to emulate the demonstrably effective strategy of guided notes (Lazarus, 1991) which provide a uniform process and corrective feedback to support struggling learners (Hamilton et al, 2000).

An initial investigation involving GVVP suggested that students in the intermediate grade levels derived greater benefit than elementary or secondary students (Tolbert, 2013), though further research is needed. Generally, the strategy has been most appropriate for students in early adolescence, but GVVP may reasonably be considered for students slightly older or slightly younger than this.

F. Peer Tutoring

Different forms of peer support are considered productive, and even natural, in both foreign language instruction (Pinter, 2011; Wright, Cavanaugh, Sainato, & Heward, 1995) and special education (Okilwa & Shelby, 2010; Scruggs, Mastropieri, & Marshak, 2012). Because language learning necessarily relies on communication and interaction, peer tutoring is a logical fit for Spanish conversation, and can be empowering to students with LD. Previous studies have indicated that peer tutoring was reciprocally helpful to LD students and to their peers in general education without identified difficulties (Elbaum et al., 1999).

Peer tutoring can contribute to an environment of shared learning, in which the teacher leads by modeling and setting expectations, and students experience heightened engagement and participation (Byrd, 2003; Pinter, 2007). Pinter (2011) indicated that peer collaboration was conducive to providing appropriate support during the process of developing either a first or second language. When implemented in a Spanish class, Wright et al. (1995) determined that peer tutoring contributed to heightened success in language learning for all students, including those with LD.

Spanish peer tutoring as a strategy for students with LD is most appropriate for the secondary level. Given that LD students often experience anxiety or feel overwhelmed by the complexity of course material at this level (Levine, 1987; Simon, 2000), peer tutoring may be an opportunity to gain meaningful practice and create social relationships which more fully involve LD students in the classroom.

V. CONCLUSION

Potentially the most reliable common elements in describing learning disabilities are the inherent complexity and potential for variation between individuals. Drawing on neurological research, educational research and practice have shed light on which practices and systems can best promote learning. For students faced with CNS dysfunction, education is necessarily more nuanced, as professionals may be more easily able to observe difficulties than to fully understand or explain them. Due to factors including phonological processing, executive function, or attention and

memory, the process of learning a non-English language has sometimes resulted in anxiety and failures for students with LD. However, there presently exists an assortment of information, techniques, and materials for designing and implementing multi-sensory instruction to promote Spanish learning for LD students. While individuals with LD are often profoundly aware of the difficulties they face, it is virtually unimaginable that they sincerely wish to settle for failure, exemption, or marginalization. It is vital that the larger educational system should be similarly unwilling to settle, instead using data and sound judgment to spark innovations and create opportunities. Further research continues to be needed on the participation of LD students in Spanish courses, as well as the use of multi-sensory techniques to teach non-European languages, or languages which do not incorporate an alphabetic system similar to English.

REFERENCES

[1] Amend, A. E., Whitney, C. A., Messuri, A. T., & Furukawa, H. (2009). A modified sequence for students with language-based learning disabilities. *Foreign Language Annals, 42*(1), 27-41.

[2] Archer, A. L., & Hughes, C. A. (2011). Explicit instruction: Effective and efficient teaching. New York, NY: The Guilford Press.

[3] Barr, V. (1993, April). Foreign language requirements and students with learning disabilities (ERIC Digest No. ED 355 834). Washington, DC: ERIC Clearinghouse on Languages and Linguistics.

[4] Blumstein, S. F., Burton, S. W., & Small, S. L. (2000). The role of segmentation in phonological processing: An fMRI investigation. *Journal of Cognitive Neuroscience, 12*(4), 679-690.

[5] Byrd, D. R. (2003). Practical tips for implementing peer editing tasks in the foreign language classroom. *Foreign Language Annals, 36*(3), 434-441.

[6] Byrnes, J. P, & Wasik, B. A. (2009). Language and literacy development: What educators need to know. New York, NY: The Guilford Press.

[7] Celestino, W. J. (1993). Total physical response: Commands, not control. *Hispania, 76*(4), 902-903.

[8] Coles, G. (2004). Danger in the classroom: 'Brain glitch' research and learning to read. *Phi Delta Kappan, 85*(5), 344-351.

[9] Dal, M. (2008). Dyslexia and foreign language learning. In G. Reid, A. Fawcett, & F. Manis (Eds.), *SAGE handbook of dyslexia* (pp. 439-454). London, GBR: Sage Publications, Inc.

[10] Darrow, A. A. (2012). Students with learning disabilities in the music classroom. *General Music Today, 26*(1), 41-43.

[11] Dever, A. (2008). Teaching Spanish grammar: Effective contextual strategies. *Hispania, 91*(2), 428-434.

[12] Duvall, E. D. (2006). Including students with disabilities in a foreign language class. *Teaching Exceptional Children, 38*(6), 42-48.

[13] Ehrman, M. E. (1996). Understanding second language learning difficulties. Thousand Oaks, CA: SAGE Publications, Inc.

[14] Elbaum, B., Vaughn, S., Hughes, M., & Moody, S.W. (1999). Grouping practices and reading outcomes for students with disabilities. *Exceptional Children, 65*, 131-140.

[15] Furman, N., Goldberg, D., & Lusin, N. (2010). Enrollments in languages other than English in United States institutions of higher education, Fall 2009. Retrieved from http://www.mla.org/pdf/2009_enrollment_survey.pdf (accessed 14/8/2014).

[16] Ganschow, L., & Sparks, R. (1995). Effects of direct instruction in Spanish phonology on the native-language skills and foreign-language aptitude of at-risk foreign-language learners. *Journal of Learning Disabilities, 28*(2), 107-120.

[17] Gardner, R., Heward, W. L., & Grossi, T. A. (1994). Effects of response cards on student participation and academic achievement: A systematic replication with inner-city students during whole-class science instruction. *Journal of Applied Behavior Analysis, 27*(1), 63-71.

[18] Gass, S. M., & Selinker, L. (2001). Second language acquisition: An introductory course (2nd Ed.). Mahwah, NJ: Lawrence Erlbaum Associates.

[19] Glisan, E. W. (1986). Total physical response: A technique for teaching all skills in Spanish. *Foreign Language Annals, 19*(5), 419-527.

[20] Gonzalez-Barrera, A., & Lopez, M.H. (2013). Spanish is the most spoken non-English language in U.S. homes, even among non-Hispanics. Retrieved from http://www.pewresearch.org/fact-tank/2013/08/13/spanish-is-the-most-spoken-non-english-language-in-u-s-homes-even-among-non-hispanics/ (accessed 14/8/2014).

[21] Guebert, T. (1991). Bringing baseball into first-year Spanish. *Hispania, 74*(2), 433-434.

[22] Herrera, L., Lorenzo, O., Defior, S., Fernandez-Smith, G., & Costa-Giomi, E. (2011). Effects of phonological and musical training on the reading readiness of native- and foreign-Spanish-speaking children. *Psychology of Music, 39*(1), 68-81.

[23] Individuals with Disabilities Education Act Regulations. (2006). 34 C.F.R. § 300.1 *et seq.* Retrieved from http://idea.ed.gov/download/finalregulations.pdf (accessed 14/8/2014).

[24] Kartal, G. (2006). Working with an imperfect medium: Speech recognition technology. *Journal of Educational Multimedia and Hypermedia, 15*(3), 303-328.

[25] Kennedy, T. J. (2006). Language learning and its impact on the brain: Connecting language learning with the mind through content-based instruction. *Foreign Language Annals, 39*(3), 471-486.

[26] Kibby, M. Y., Marks, W., Morgan, S., & Long, C. J. (2004). Specific impairment in developmental reading disabilities: A working memory approach. *Journal of Learning Disabilities, 37*(4), 349-363.

[27] Kleinert, H. L., Cloyd, E., Rego, M., & Gibson, J. (2007). Students with disabilities: Yes, foreign language is important. *Teaching Exceptional Children, 39*(3), 24-29.

[28] Kormos, J., & Safar, A. (2008). Phonological short-term memory, working memory and foreign language performance in intensive language learning. *Bilingualism: Language and Cognition, 11*(2), 261-271.

[29] Lambert, M. C., Cartledge, G., Heward, W. L., & Ya-yu, L. (2006). Effects of response cards on disruptive behavior and academic responding during math lessons by fourth-grade urban students. *Journal of Positive Behavior Interventions, 8*(2), 88-99.

[30] Lazarus, B. D. (1996). Flexible skeletons: Guided notes for adolescents with mild disabilities. *Teaching Exceptional Children, 28*(3), 36-40.

[31] Levine, M. (1987). Developmental variation and learning disorders. Cambridge, MA: Educators Publishing Service.

[32] McLaughlin, M. J. (2009). What every principal needs to know about special education (2nd Ed.). Thousand Oaks, CA: Corwin Press.

[33] Medina, J. (2008). Brain rules: 12 principles for surviving and thriving at work, home, and school. Seattle, WA: Pear Press.

[34] Mercer, C. D., Mercer, A. R., & Pullen, P. C. (2011). Teaching students with learning problems (8th Ed.). Upper Saddle River, NJ: Pearson.

[35] Moreno, R., & Mayer, R. E. (2002). Verbal redundancy in multimedia learning: When reading helps listening. *Journal of Educational Psychology, 94*(1), 156-1163.

[36] Moreno, R., & Mayer, R. E. (2007). Interactive multimodal learning environments. *Educational Psychology Review, 19*, 309-326.

[37] Okilwa, N. S. A., & Shelby, L. (2010). The effects of peer tutoring on academic performance of students with disabilities in grades 6 through 12: A review of the literature. *Remedial and Special Education, 31*(6), 450-463.

[38] Palladino, P., & Cornoldi, C. (2004). Working memory performance of Italian students with foreign language learning difficulties. *Learning and Individual Differences, 14*, 137-151.

[39] Pinter, A. (2007). Benefits of peer-to-peer interaction: 10-year-old children practising with a communication task. *Language Teaching Research, 11*(2), 1-19.

[40] Pinter, A. (2011). Children learning second languages. London, GBR: Palgrave MacMillan.

[41] Reading is Fundamental (2012). Read along stories & songs. Retrieved from http://www.rif.org/kids/readingplanet/bookzone/read_aloud_stories.htm (accessed 14/8/2014).

[42] Rhodes, N. C., & Pufahl, I. (2009). Foreign language teaching in U.S. schools: Results of a national survey. Retrieved from file:///C:/Users/Owner/Downloads/ForeignLanguageExecutiveSummary.pdf (accessed 14/8/2014).

[43] School Specialty (2012). Childcraft Spanish read-along small books - Set of 30 with 6 of each title. Retrieved from http://store.schoolspecialty.com/OA_HTML/ibeCCtpItmDspRte.jsp?minisite=10206&item=481645 (accessed 14/8/2014).

[44] Scott, S. S., & Manglitz, E. (1997). Foreign language and learning disabilities. Retrieved from www.ldonline.org/article/6066 (accessed 14/8/2014).

[45] Scruggs, T. E., Mastropieri, M. A., & Marshak, L. (2012). Peer-mediated instruction in inclusive secondary social studies learning: Direct and indirect learning effects. *Learning Disabilities Research and Practice, 27*(1), 12-20.

[46] Shaw, R. A. (1999). The case for course substitutions as a reasonable accommodation for students with foreign language learning disabilities. *Journal of Learning Disabilities, 32*(4), 320-328.

[47] Sousa, D. A. (2001). How the brain learns (2nd Ed.). Thousand Oaks, CA: Corwin Press.

[48] Sparks, R. L., Artzer, M., Patton, J., Ganschow, L., Miller, K., Hordubay, D. J., & Walsh, G. (1998). Benefits of multisensory language instruction for at-risk foreign language learners: A comparison study of high school Spanish students. *Annals of Dyslexia, 48*, 239-270.

[49] Sparks, R., & Ganschow, L. (1993). The effects of multisensory structured language instruction on native language and foreign language aptitude skills of at-risk high school foreign language learners: A replication and follow-up study. *Annals of Dyslexia, 43*(1), 194-216.

[50] Sparks, R. L., & Miller, K. S. (2000). Teaching a foreign language using multisensory structured language techniques to at-risk learners: A review. *Dyslexia, 6*, 124-132.

[51] Swanson, C. (2012). Learning disabilities primer. *Journal of Singing, 68*(3), 315-319.

[52] Tolbert, J. B. (2013). The effects of guided visual vocabulary practice for students with learning disabilities on learning concrete nouns in Spanish. http://deepblue.lib.umich.edu/handle/2027.42/102513 (accessed 14/8/2014).

[53] Topping, K., & Ferguson, N. (2005). Effective literacy teaching behaviours. *Journal of Research in Reading, 28*(2), 125-143.

[54] Tuan, L. T., & An, P. T. V. (2010). Teaching English rhythm by using songs. *Studies in Literature and Language, 1*(2), 13-29.

[55] Willis, J. (2008). Teaching the brain to read: Strategies for improving fluency, vocabulary, and comprehension. Alexandria, VA: Association for Supervision and Curriculum Development.

[56] Wilson, K., & Swanson, H. L. (2001). Are mathematics disabilities due to a domain-general or a domain-specific working memory deficit? *Journal of Learning Disabilities, 34*(3), 237-248.

[57] Wolfe, D. E., & Jones, G. (1982). Integrating total physical response strategy in a level I Spanish class. *Foreign Language Annals, 14*(4), 273-280.

[58] Wright, J. E., Cavanaugh, R. A., Sainato, D. M., & Heward, W. L. (1995). Somos todos ayudantes y estudiantes: Evaluation of a classwide peer tutoring program in a modified Spanish class for secondary students identified as learning disabled or academically at-risk. *Education and Treatment of Children, 18*, 33–52.

Joshua B. Tolbert earned a B.A. from Western Michigan University, with a double major in Spanish and art education. He later earned an M.A. in liberal studies and an Ed.D. in special education, both from the University of Michigan-Dearborn. He currently serves as a teacher of students with learning disabilities at Huron High School, and has previously been an instructor of Spanish and visual arts. In both research and practice, Dr. Tolbert is exploring effective strategies for teaching vocabulary to students with disabilities, with particular emphasis on learning a language beyond English.

Kim Killu is Professor of Special Education at the University of Michigan-Dearborn, in Dearborn, Michigan, U.S.A. She earned her B.S. in psychology from Michigan State University, her M.S. in Clinical Behavioral Psychology from Eastern Michigan

University, and her Ph.D. in Special Education and Applied Behavior Analysis from The Ohio State University. Dr. Killu has practiced as a psychologist with the full spectrum of disability categories in a variety of clinical, vocational, and educational settings. She is also a doctoral level Board Certified Behavior Analyst. Dr. Killu's interests focus on the assessment and treatment of individuals with severe behavior disorders, community inclusion, social and instructional strategies for individuals with behavior disorders, and Functional Behavior Assessment and Behavior Intervention Planning policy and practice.

Belinda Davis Lazarus is a Professor Emeritus of Special Education in the College of Education, Health, and Human Services at the University of Michigan-Dearborn. She taught students with learning disabilities and emotional disorders, supervised special education teachers, and developed and taught college courses in learning disabilities and related services. Dr. Lazarus has also authored numerous articles in the areas of inclusion, assessment, and collaboration.