Engage and Excite All Learners
Through a Visual Literacy Curriculum

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This paper discussed a study involving two groups of teacher candidates' implementations of a visual literacy curriculum in their preclinical field experience. The purpose was to explore whether the curriculum provided a viable way for them to implement Universal Design for Learning (UDL) in teaching their diverse learners, including students with disabilities and English as a second language learners. Teacher and student surveys, reflection notes, lesson plans, and artifacts in the lessons were analyzed. Findings indicated that the visual literacy curriculum promoted universal access to learning and conversely, UDL principles provided valuable guidelines for creating lessons that maximize the effectiveness of the visual literacy tools.

Background

According to the National Center for Education Statistics (NCES, 2007), 52 percent of students with disabilities spent 80 percent of more of the school day in a general classroom in 2005. With the reauthorization of *Individuals with Disabilities Education Improvement Act* (2004) and *No Child Left Behind Law* (P.L. 107-110, U.S. Department of Education, 2004), more mephasis is put on ensuring the access and progress in the general education curriculum by students with disabilities. It is urgent that teachers learn how to respond to diverse learners' needs pedagogically (Darling-Hammond & Sykes, 2003; Nieto, 2002).

This paper describes a curriculum model and its strategies that can be used to excite and engage and excite diverse learners in their history and social studies lessons. Content reading and understanding of history and social studies topics pose difficulties for many students. When print materials are the main medium for representing knowledge, participation and progress in the curriculum is compromised for diverse learners who struggle with text-based learning. As they move on to higher grades, they become increasingly frustrated in reading and understanding in the content areas heavily dominated by lengthy texts (Watkins et al., 2004). The information in the texts is often elusive to students on account of difficulties not only with decoding and comprehension but also with organizing and recalling information. As a result, many students with special needs are provided accommodations that often result in watering down of rich content and focusing on remedial instruction of basic skills, the very areas of deficits for these students. The fun and importance of learning history and social studies are taken away from them.

This paper delineates an explorative study on the viability of a visual literacy curriculum for teaching history and social studies. As part of their preclinical field experience, two groups of

teacher candidates learned about the relevant tools in the curriculum and implemented the strategies with their focal student(s) who had mild disabilities or limited English proficiency.

In history and social studies, visual literacy involves the use of maps, pictures, views, photographs, etc. to promote learning. These visuals, primary and secondary sources, can be used with verbal texts or independently (Bolter, 1998). Critical examinations of visual materials can provide foundations for the understanding of the context and content of a topic. Students can use the context information to conduct inquiry into the key concepts being studied. Visuals facilitate analysis and interpretation by helping students to make connections between information and concepts.

Helping diverse learners making connections with historical content requires them to utilize all available information sources, like historicans do, and reach conclusions on the meaning and significance of events they have studied (Denos & Case, 2006; Werner, 2004). In order to facilitate this kind of intertextual reading, graphic organizers can act as visual bridges for picture and textual material. Research literature supports the use of graphic organizers to enhance reading comprehension among students with learning disabilities (LD) and mild cognitive impairment (Boyle & Weishaar, 1997; Gallego et al., 1989; Kim, Vaughn, Wanzek, & Wei, 2004).

The visual literacy curriculum in the study draws on the design framework called Universal Design for Learning (UDL). UDL represents a new paradigm of inclusive teaching practices based on the anticipation of diverse learning needs in classrooms and removal of potential barriers from the outset of curriculum planning (McGuire, Scott, & Shaw, 2003). UDL applied to curriculum and instruction involves thee basic principles: multiple means of representation, expression, and engagement (McGuire, Scott, & Shaw, 2006). These principles

correspond to three neural networks in the brain: the recognition network, the strategic network, and the affective network. When applied to teaching practices, the three principles can enable teachers to plan collaboratively for accessible and flexible general education curriculum by building in features of instruction that match up with individual capabilities and functional needs from the outset of instruction (Jackson & Harper, 2005; Rose & Meyer, 2002).

Purpose

This paper summarizes the results of a study of a field-based classroom project requiring the the implementation of a visual literacy curriculum by two groups of teacher candidates in two adjacent semesters. Table 1 illustrates the timeline and the structure of the study.

TABLE 1 *The Study Timeframe and Structure*

Context	Group 1	Group 2
Time	Fall Quarter, 2006 September 12—November 21	Spring Quarter, 2007 April 2—June 18
Goal	Fieldtest the viability of the visual literacy curricular materials with actual grade school students.	
Main issue	• Viability of the visual literacy curriculum as an instructional application for diverse learners in history and social studies learning	
Research questions	1. How did the teacher candidates implement and perceive the lessons involving the visual literacy strategies? 2. In what ways did the visual literacy curriculum strategies promote the implementation of UDL in the lessons?	

The overarching issue to be addressed in this study is whether the visual literacy curriculum provided a viable tool for teachers to create accessible and engaging lessons for their students, each of whom had unique special needs. To address this issue, the study investigates two questions. First, it examines how the teacher candidates implemented the lessons involving the visual literacy curriculum and how they perceived the use of the relevant strategies. This question helps reveal whether the incorporation of the visual literacy curriculum produced beneficial and desirable results.

The second research question looks into the potential of the visual literacy curriculum as a viable practice for differentiated instruction to promote the implementation of UDL. In other words, this question helps to identify ways to use the visual literacy curriculum in the lessons that contributed to attainment of the three basic principles of UDL—flexible and alternative means of knowledge presentation, engagement in learning, and student expression.

Context

The Course

In this course, the author introduced the concept of visual literacy, modeled the teaching with the above-mentioned visual literacy curricular resources, and provided collaborative class exercises to help the teachers understand the strategies. The inquiry-based curriculum emphasizes the integration of visual primary sources and visual strategies in teaching and learning processes to facilitate learning by all students, especially those with special education needs and limited English proficiency. The curriculum is marked by progressive levels of reading from basic reading of pictures (i.e. observation, decoding of pictures) and labeling of important features observed on the pictures, to the more comprehensive reading of content—both

visual and written—for analysis and interpretation of meanings. Graphic organizers were also designed as part of the visual literacy curriculum to facilitate organization of intertextual readings. This multi-component visual curriculum also stresses guided practice and flexibility in use according to individual abilities.

Participants

The participants of the research came from the two cohort groups of teachers enrolled in the methods course as mentioned before. To partially fulfill the 15-hour field experience requirement for this course, the teacher candidates learned the visual literacy curriculum in this course and then taught the curriculum materials to one focal student or a small group of students with diverse learning needs.

The first cluster of candidates implemented the visual literacy curriculum during the fall term of 2006 as a pilot test. The second group did this during the spring term of 2007. In the second part of the study, improvements were made to the survey questions for teachers and students, the visual curriculum materials, and the project guidelines based on the preliminary results garnered from the pilot study conducted with the first cluster.

The first cluster consisted of 18 people and all of them held no initial teacher certificates. The second cluster was comprised of a cluster of 12 people, with half of them having taught in schools or were also full-time teachers while pursuing their special education teaching certificate and master degree at the time of the study.

The students involved in the study ranged from having learning disabilities (LD), attention deficit hyperactive disorders (ADHD), to developmental disorders and Limited English Proficiency (LEP). Grades varied from kindergarten to high school. The sources of the students were of several kinds. The majority of the students were those with whom the teacher candidates

had already been working in schools as teaching assistants and paraprofessionals. In one case, the selected student was the candidate's daughter who had Learning Disabilities.

Procedures

Both groups of teachers were given similar instructional guidelines for the project. They were provided with visual literacy curricular resources related to the history of a large Midwestern city in the United States. In the project, they were asked to teach a lesson in history or integrated language arts/social studies by incorporating the visual literacy curriculum they had learned in the course.

The teachers involved in the study were encouraged to use UDL principles as guidelines for implementing and adapting the visual literacy curriculum to meet individual student needs. Before the teacher candidates used the visual literacy materials with their students, they became familiar with the materials in the methods course.

Approximately 10 hours were spent on familiarizing the teacher candidates with the visual literacy curriculum. This includes 1) reading of 4 to 5 articles related to visual literacy pertaining to K12 instruction and Universal Design for Learning, 2) lecturing on the visual literacy concepts and examples of use in teaching, 3) entire class and small group exercises of visual strategies developed for the visual literacy curriculum, and 4) explanation of the field testing project accompanied with student guidelines and project information sessions in the first several weeks before they used the materials with their students.

Lessons designed by the teacher candidates varied in length from 1 class period to 4- and ½ -hour-long of unit plan.

Visual Literacy Curriculum

The Visual literacy curriculum was developed for a larger project called Picturing Chicago funded by the National Endowments for the Humanities (NEH), which provides teachers with strategies to use pictures as learning documents for all students, including second language learners and students with special education needs.

The curriculum follows a progressive sequence from observation and labeling to interpretation using graphic organizers to facilitate learning. Specifically, there are four strategies combining the use of visual images (both primary and secondary sources) and graphic organizers: Visual Labeling Strategy, Reading for Content Strategy-Visuals with or without Actions strategy, Reading for Analysis to Understand Why Strategy, and Reading for Interpretation to Assess Significance Strategy. All strategies exist in three formats for teachers to easily adapt them for instruction: on paper, as PowerPoint templates, and on the web.

In the first strategy, students can use an anchor image related to the topic of study to label the most important features. Differentiated use of the strategy could be achieved through the use of scaffolds such as partially labeled features on the image for some students and availability of the vocabulary associated with the important parts of the visual. Figure 1 is a blank template of the Labeling Strategy.

The second strategy—Reading for Content-Visuals with or Without Action allows students to organize their reading of the image according to who, what, when, where, and how questions. Students can also draw on their prior experience to answer some of these questions. Through this exercise, students begin to move from using pictures for activation of background and interest to examining pictures methodologically for transitioning to the basic understanding of the content being studied. See Figure 2 for more details.

Picturing Chicago ———————————— **Visual Literacy for All Learners**

Labeling

Focus: _____

Using the questions below, read the visual image to label the most important features.

1) Where is _____?   4) Where is _____?
2) Where is _____?   5) Where is _____?
3) Where is _____?   6) Where is _____?

FIGURE 1 *Labeling Strategy*

The third strategy is Reading for Analysis to Understand Why Strategy for learning about one particular aspect of the topic such as cause and effect. This strategy builds upon what is learned from the visual image embedded in the previous two strategies to connect to information in other sources. Reading for Analysis is designed to foster students' habits and skills in generating and answering questions related to the key aspects of the topic based on both visual and written texts document sources. Figure 3 illustrates these questions arranged in logical sequences.

Visual Literacy for All Learners

Reading for Content-Visuals with Action

Based on the picture, when did this happen?

When | Where

Based on the picture, where is this?

Who is in the picture?

Who

What are they doing?

Actions

To whom or what are they doing this?

Whom or what

How are they doing these things?

How

Summarize the Picture or Write a Caption

Consult other sources if the information is not in the picture and its title.

Visual Literacy for All Learners

Reading for Analysis to Understand Why

Explaining Cause and Effect

Use the questions generated below to consult other sources for more information.

What questions did reading the visual raise about cause and effect?

?
?
?

Organizing Information for Understanding Cause and Effect

Which people acted? What caused them to act?

Cause | Process

What actions and methods did people use?

Effect

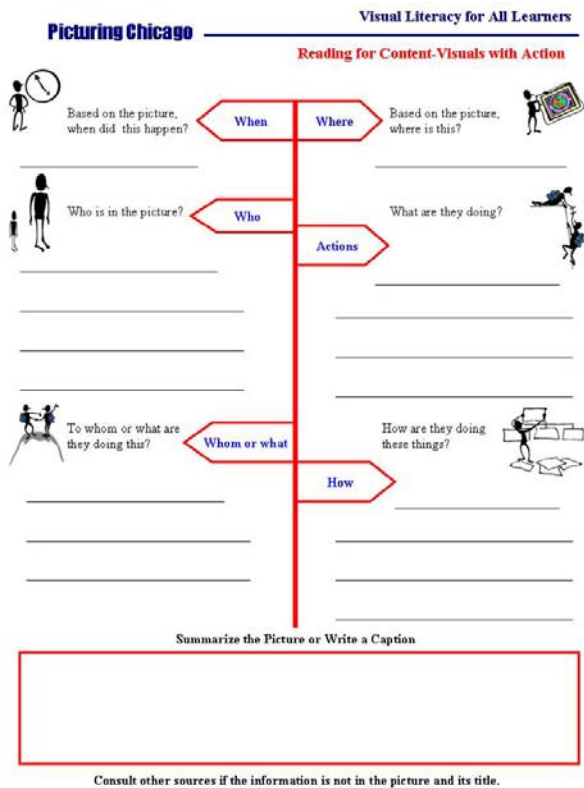Explain the results (what caused something to happen, what resulted, what was the effect?)

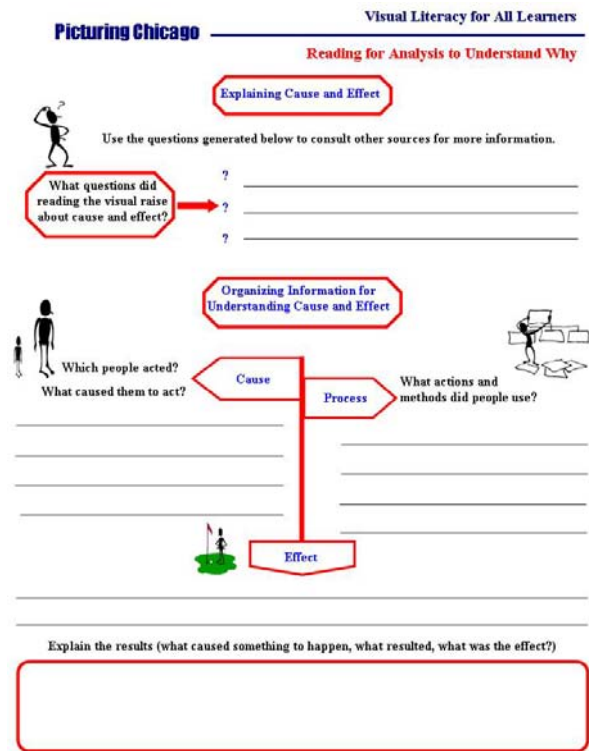FIGURE 2 *Reading for Content Strategy*   FIGURE 3 *Reading for Analysis Strategy*

The fourth strategy—Reading for Interpretation—is a scaffolding tool for students to examine all available sources to learn about the contemporary and long-term impact of the topic. Students will need to review what they have learned so far based on the visual and other sources about the content and answer the larger question of significance of a piece of history. Here, they will also learn to identify the deeper meanings of their learning by making personal and historical connections. Figure 4 shows the details of the strategy.
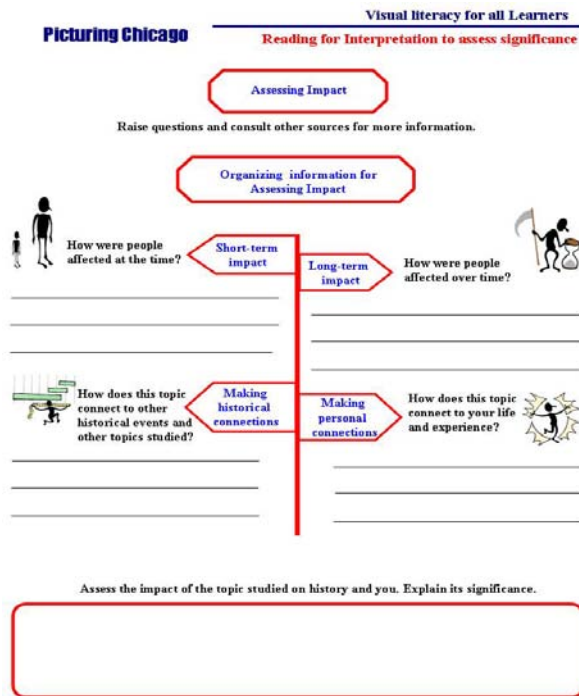
Picturing Chicago

Visual literacy for all Learners

Reading for Interpretation to assess significance

Assessing Impact

Raise questions and consult other sources for more information.

Organizing information for Assessing Impact

How were people affected at the time? **Short-term impact** **Long-term impact** How were people affected over time?

How does this topic connect to other historical events and other topics studied? **Making historical connections** **Making personal connections** How does this topic connect to your life and experience?

Assess the impact of the topic studied on history and you. Explain its significance.

FIGURE 4 *Reading for Interpretation Strategy*

Data Collection

The following types of data were collected for this study (see Figure 5):

- artifacts produced by the teachers and their students, such as lesson plans, visual materials prepared by teachers, visuals provided by the author, teachers' written reflections

- visual activities sheets completed by the students, verbal and written communications between the author and teachers, and the instructional guideline for the implementation

- teacher and student surveys on their perceptions of the uses of visual materials and visual strategies in learning, and the implementation of the project

- teacher accounts of the implementation process and their observation of the students' response to the visual strategies
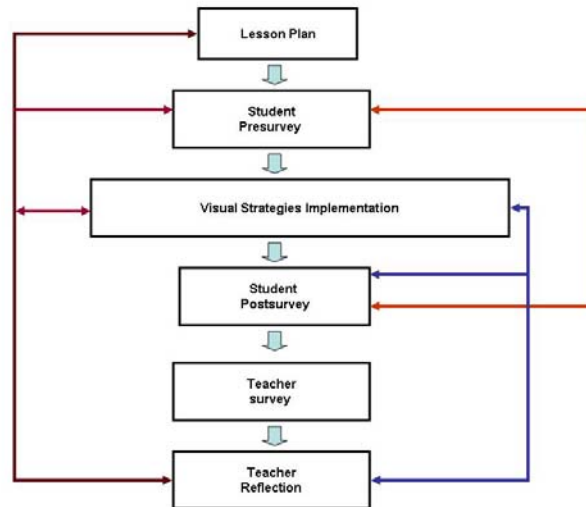

FIGURE 5 *Data Collection and Analysis*

Teacher candidates first designed their lesson plans according to UDL principles to ensure maximum access to the lesson by building in multiple ways of presenting information and engaging diverse learners in the lesson plan. The use of visual curriculum materials under study was regarded as one key to creating an accessible lesson plan for their target students. A student survey was given prior to the lesson to gain information about the student's existing understanding and use of visual materials for learning. This survey data, along with the implementation process itself, and the post-implementation survey data fed into the teacher candidates reflections about the project. All these data sources as shown on Figure 1 helped the researchers to gain valuable insight into the viability of the visual literacy curriculum and factors influencing the effectiveness of the lessons implemented by the teacher candidates.

Content analysis technique and interpretive approaches (Berg, 2004) were employed as research tools for studying the above questions. The goal of the data analysis was to extract

important variables influencing the implementation and effectiveness of visual literacy strategies for more focused larger-scale classroom research to be conducted in the future. All written and visual artifacts were read repeatedly for content analysis and data triangulation purposes (Atkinson, 1996; Silverman, 2001). Patterns of teachers' perceptions and insights emerged from the interpretation of triangulated data.

Findings

Both qualitative and quantitative data sources were employed for analysis to answer the two research questions posed for this study: How did the teacher candidates implement and perceive the lessons involving the visual literacy strategies? In what ways did the visual literacy curriculum strategies promote the implementation of UDL in the lessons? The results indicated that the teacher candidates implemented the visual literacy curriculum lessons in ways pertaining to both the general actualization of the lessons and the use of the the strategies in the visual literacy curriculum. The finding from the pre- and after-lesson teacher surveys indicated that all candidates responded positively to the visual literacy curricular activities.

In addition, the visual literacy curriculum was found to be a viable tool that could provide diverse learners with UDL-based learning experience, especially through using the visual images and graphic organizers as alternative means to access content, engage in the learning process, and demonstrating knowledge understanding and mastery. Examples of such implementations facilitative of UDL teaching and learning processes will be included in the discussion.

While the visual literacy curriculum served as a viable tool to promot UDL lessons, the findings also pointed to the other direction of the relationship: that is, the UDL framework for planning and designing lessons helped the teacher candidates utilize the visual literacy

curriculum more effectively. They used general guidelines from UDL related to the anticipation of barriers prior to carrying out lessons and various forms of adaptations during instruction to ensure successful implementation of the visual literacy curriculum lessons.

The two research questions and relevant findings are discussed in the following sections.

Question 1: How did the teacher candidates implement and perceive the lessons involving the

visual literacy strategies?

This question can be addressed by disucssing two related issues. The first part of the discussion concerns the teacher candidates' implementation and perception of the visual literacy curriculum. The second part looks at the general aspects of the teacher candidates' lesson implementation, including considerations made regarding their students' special needs.

Visual Images

The teacher candidates made individual decisions regarding the selection, the quantity, and the functions of the visual images to be used in their lessons.

As required by the field-based project, they were free to choose one exploration topic among the preexisiting 30 explorations related to the Chicago city history during the late 19th century and early 20th century. The explorations, along with the embedded written texts and primary visual sources, and the visual strategies, were available to the teacher candidates in both paper and PowerPoint formats.

The teacher candidates were asked to use at least one visual image from the exploration package provided to them. The majority of the lessons also incorporated visual images selected by themselves from the online image archive of the Library of Congress website or from other websites. For example, the teacher candidate whose lesson was based on the exploration *Chicago*

13

Skylines used some modern photos showing the development of Chicago city skylines found in the Internet besides the primary source photos depicting the old Chicago city.

Different types of visual images were utilized such as photos, maps, paintings, and even illustrations on book covers. In general, the number of visual images included in the lesson plans created by both groups of teacher candidates ranged from 3 to 20.

The lesson implementations varied not only in the selection of images but also the ways they were used. For instance, in some lessons, one image was used as an anchor or anticipation guide to help the students activate background knowledge and generate discussions. Then, a myriad of other images were presented to the student(s) for more detailed reading and information gathering.

The images were combined with different graphic organizers included in the visual literacy curriculum. Some teacher candidates used visual images without obvious or clear connection with any graphic organizer, while others used it as an integraal part of the graphic organizer strategies.

Visual Aids/Graphic Organizers

Central to the visual literacy curriculum in the study was the four visual aids in the form of graphic organizers: Visual Labeling Strategy, Reading for Content Strategy-Visuals with or without Actions strategy, Reading for Analysis to Understand Why Strategy, and Reading for Interpretation to Assess Significance Strategy.

Before carrying out the lessons, the teacher candidates were instructed to treat the four strategies as being in a progressive sequence aimed to provide guided practice for students towards higher-order thinking. In this sequence, teachers can focus on both visual images and other learning sources including the written text through the graphic organizers.

The candidates were encouraged to make any necessary customizations fitting the topic of the lesson and individual student needs. Most of the lessons followed the sequence, starting with the basic reading of a visual image and moving on to the graphic organizers for integrating the information drawn from the combined sources of visual(s) and other available texts for deepened understanding and analysis of the content.

Overall, the majority of teacher candidates made no changes to the format of the graphic organizers they chose for their lessons except in several cases represented as follows:

- Adoption of teacher-constructed graphic organizer

- Circling sections of a picture inserted on the labeling strategy organizer so that the parts to be labeled by the students appeared more salient

- Selection of one question on the Reading for Content strategy sheet and use it to form a single response-to-visual sheet resembling document-based question format

In the reflection narratives, the teacher candidates expressed satisfaction with the lessons and agreed that the visual literacy curriculum had been a viable tool for teaching history and social studies. Teacher surveys supported this finding.

Data drawn from the after-lesson survey by the first group of teacher candidates indicated that the majority of them perceived that their lessons went well as expected (89%). Teachers' satisfaction with their lessons was confirmed by their students' survey responses to the various strategies in the visual literacy curriculum. Figure 6 illustrates this result:

Question 1: The implementation of visual strategies met my expectation.

16			

N=18

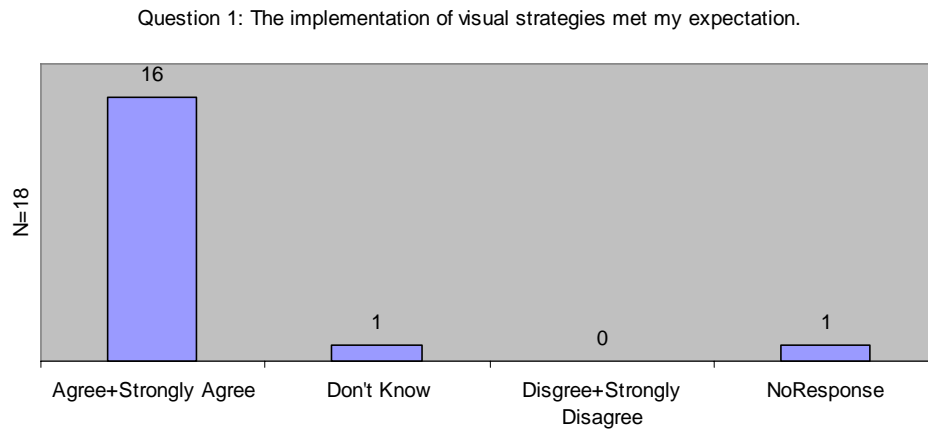|			
	1	0	1
Agree+Strongly Agree	Don't Know	Disgree+Strongly Disagree	NoResponse

FIGURE 6 *Group 1 teacher candidates' response to survey question 1*

The responses to the same survey item by the second teacher group also showed positive results in terms of successful implementation of the lessons and visual strategies (Figure 7). In this second group, 9 complete surveys were counted out of a pool of 12 teacher candidates. All of the teacher candidates felt that the lessons on visual strategies to teach history had met their expectations and proceeded smoothly according to their plans.

Question 1. The implementation of visual strategies met my expectation.

9			

N=9

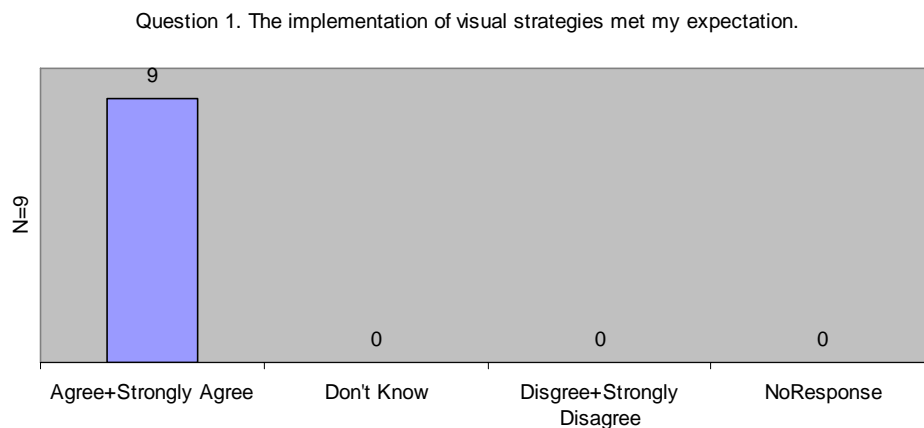|			
	0	0	0
Agree+Strongly Agree	Don't Know	Disgree+Strongly Disagree	NoResponse

FIGURE 7 *Group 2 teacher candidates' response to survey question 1*

The positive perceptions of the teacher candidates certainly were a result of their perceptions of how their students responded to the lessons. Figure 8 and 9 illustrate how the lessons went for the students taught by the first and second group of teacher candidates respectively.
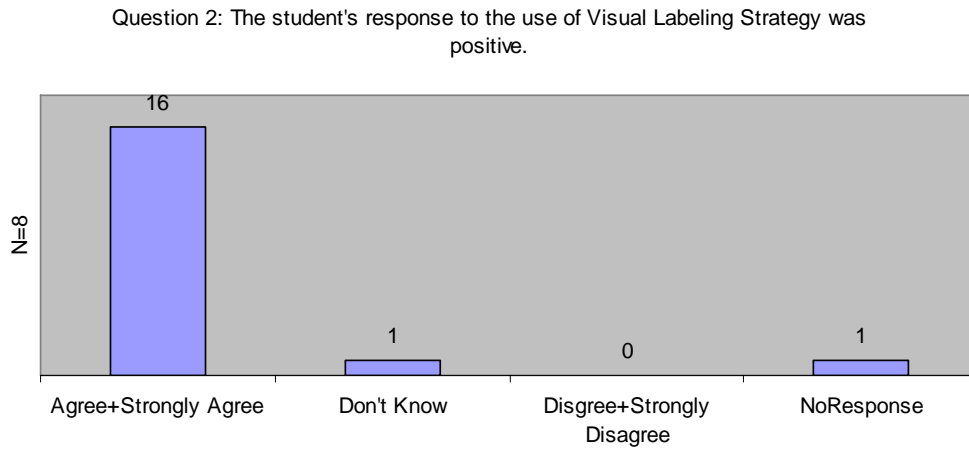
Question 2: The student's response to the use of Visual Labeling Strategy was positive.

FIGURE 8 *Group 1 teacher candidates' response to survey question 2*

Question 2: The student's response to the use of Visual Labeling Strategy was positive.
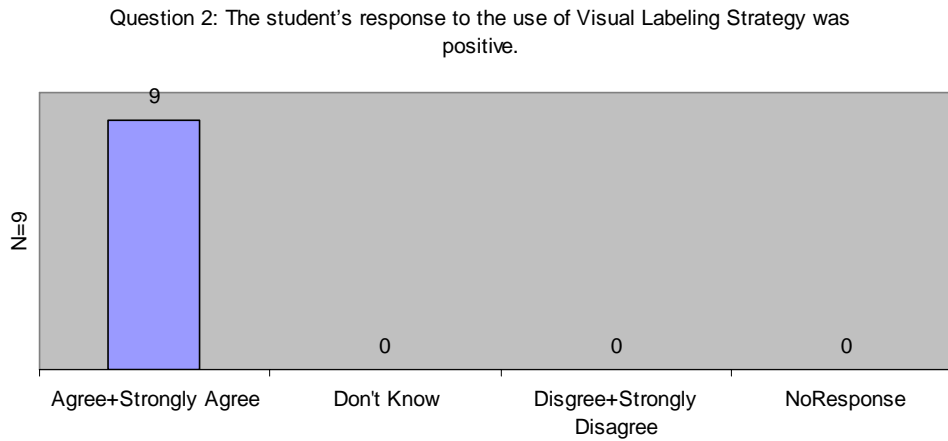
FIGURE 9 *Group 2 teacher candidates' response to survey question 2*

The teacher candidates' responses to both open-ended and close-ended items on the surveys indicated that they perceived the visual literacy strategies as being benefitial and useful in teaching students with diverse special needs.

General Considerations

The teacher candidates were required to reflect on the process of implementation and identify what went well with the lesson and in what ways the visual literacy strategies were helpful to the students. They also reflected on how to improve the lessons in the future. The narrative provided valuable insight about the common attributes that contributed to successful integration of the visual-oriented tools for reading across the lessons. As much was found from successful implementation experiences as from some of the teacher candidates' after-fact reflections on what they might have missed and what they thought would have worked better for the lessons. Teacher surveys and student surveys provided additional data for triangulation.

The successful implementation of the lessons can be attributed to three major factors: anticipation of student barriers, adaptations, and the visual literacy strategies.

Anticipation of Barriers. The first common attribute for successful implementation is the anticipation for instructional barriers. For lessons that went satisfactorily, it was found that the teacher candidates had anticipated the focal student's needs prior to the lessons.

Having fully anticipated the students' needs is a factor that affected the teacher candidates' selection of a topic or pictures that grab students' attention, and subsequently the extent the lessons would be engaging to the students.

Various means were utilized by the teacher candidates to become familiar with the students' current levels of performance and interests: reading the students' Individualized Educational goals, talking with teachers about the students' learning profiles and special needs,

and talking with parents about the students' likes and dislikes. The knowledge about the students was also gained through the candidates' previous working experiences with their students, or from their knowledge about disabilities and their potential impact on the students' participation in the lesson plans. This effort paid off for the teacher candidates who successfully engaged the students from the beginning of the lessons.

In addition, some teacher candidates paid close attention to the pre-lesson surveys for students regarding their prior knowledge and skills with the use of visuals and graphic organizers just to prepare themselves better for the implementation of the lessons. Others examined the students' Individual Educational Plans to help them find clues about the students' reading profiles and preferences.

Adaptations. Both groups of teacher candidates were familiar with the concept of Universal Design for Learning before the project started, specifically the importance of using alternative means for knowledge presentation, student engagement, and knowledge demonstration when teaching special needs students.

All successful lessons shared a common attribute of making appropriate adaptations to the content and process suitable to the unique needs of the target student(s).

One of the most widely used adaptations made by the teacher candidates was concerned with the content of the lesson. As mentioned before, the teacher candidates were requested to select one exploration topic from amongst 30 topics related to the history of Chicago city. For many teacher candidates, the first type of content consideration pertained to their students' potential interest and familiarity with the selected topic. One teacher candidate said: "I chose to include the reading material from "Picturing Chicago: Building Parks" because the topic allowed for discussion of both city parks and maps that are familiar to this student." For students who

come from first-generation immigrant families, a teacher candidate developed a lesson around the immigration topic connected to the student's specific history or experience.

Other teacher candidates focused on a topic that had some connection with what their students had been learning about at school. For example, the exploration "Picturing Chicago: the Gateway City" was selected by a teacher candidate because her focal student had learned about the settling of America in social studies class and studied literature related to the immigrants' living condition in Chicago during this time period. The teacher candidate chose the exploration article that fit right away into the student's school curriculum. The teacher candidate also mentioned in the reflection that the student had enjoyed lessons on related topics and therefore she thought that he might enjoy the Chicago as a gateway city topic.

Another important adaptation was the text adaptation. Since almost all of the students involved in the project were formally diagnosed with one or multiple disabilities that impacted on their reading performances, the teacher candidates had modified the provided texts in the history explorations by various degrees. Some wrote their own texts for students based on the introductory texts in the explorations. Others created hybrid texts with both pictures and words as describe earlier on. Many teacher candidates also highlighted certain vocabularies in the texts or include alternative definitions of the vocabularies in parenthesis for the students. In these hybrid texts, pictures were integrated in the written texts to provide an accommodating reading experience for students struggling with reading and decoding of words. Some of the pictures were primary source photos chosen from both the explorations and external sources. It was interesting to see how the teacher candidates took the visual literacy concept and applied in the creation of adaptive texts for the special needs students.

Still other candidates took a section of the original exploration article and create a simplified text for the students. Some teacher candidates did not change the text much but decided to read aloud the text to the students or took turns reading the text with the students so as to alleviate the potential stress experienced by the students who had difficulties in reading.

In summary, adaptations that were carefully thought out based on anticipated barriers for students played an important role towards making the lessons successful.

According to the universal design for learning framework, it is essential that teachers embed accessible and adaptive features into curriculum design from the beginning. The finding indicates that the successful lessons were implemented by the teacher candidates who used UDL to guide thir lesson planning, anticipated potential instructional barriers, and incorporating necessary adaptations according to their knowledge of the students.

It came as no surprise that the teacher candidates who spent most time reading their students' Individual Education Plans, who had known their students before hand, tended to lead more successful lessons.

The next part of the discussion focuses on specific aspects of the implementation of the visual literacy curriculum that contributed to the realization of UDL in the lessons. Emphasis in the discussion shifts to the relationship between the visual literacy curriculum and its contribution to accomplishing the three basic components of UDL—multiple means of knowledge presentation, engagement in learning, and student expression/demonstration of knowledge.

Question 2: In what ways did the visual literacy curriculum strategies promote the

implementation of UDL in the lessons?

The findings concerning the first question help establish the general viability of the visual

literacy curriculum. More importantly, the second question zeroes in on the relationship between

the visual literacy curriculum and UDL lesson components. The following space discusses the

findings on the ways the incorporation and implementation of the visual literacy strategies served

the students by providing them with alternative means of accessing the content, engaging in

learning, and demonstrating what they have learned—means different from those afforded by the

written texts alone.

Visual Literacy Curriculum Enhances Students' Content Access

First of all, the visual-oriented strategies in the visual literacy curriculum allowed the

diverse learners involved in the study to better access and understand the content. Student

surveys after the lessons gave clues about how they perceived the functions of the visual literacy

strategies. In the responses to the after-lesson survey given by the first group of teacher

candidates' students, 16 out of 18 students agreed or strongly agreed to the statement "the picture

activities used in this lesson helped me understand the content better."

Only one student disagreed. This was a 15-year-old sophomore who had been diagnosed

with multiple disabilities including oppositional defiant disorder, Asperger's syndrome,

Tourette's syndrome, depression, and attention deficit disorder. He attended a therapeutic day

school at the time of the study. The visual literacy lesson was related to the topic of immigration.

The teacher candidate focused especially on the food brought in by immigrants. It could be

possible that the food topic did not particularly interest the student. Another issue with this

lesson was that the teacher candidate simply presented visuals to the student while reading the

text without treating the visuals as a special tool for inquiry. At the end of the lesson, the teacher candidate asked the student to write captions for several pictures that were not directly related to the food theme of the lesson. The pitfall of the lesson lay in the lack of a clear purpose in the use of visual images and its disconnection with other parts of the lesson.

Another student reported 'don't know' for this statement. He was a second-grade student who struggled with attention deficit issues and learning disability, though he did agree on the survey statement "I would be more likely to pay attention to pictures in history texts in the future." Interestingly, the teacher candidate pointed out that the student was very engaged and inquisitive regarding the pictures. He also made predictions based on the visuals.

Similarly, these students' responses related to the graphic organizers embedded in the visual literacy strategies also pointed to the role the graphic organizer strategies played in making the content more easily understandable. 13 out of the 18 students agreed or strongly agreed to the statement "the graphic organizers (webs) helped me understand the content better."

Two of the students disagreed with the statement. The same 15-year-old sophomore mentioned above who had multiple disabilities, was one who disagreed. It was reported by the teacher candidate in the reflection narrative that the student appeared to be distracted and the setting—the school building hallway—did not help him. The teacher candidate also wrote that the fact that this student struggled with many mental disorders might have been the reason why he had not been able to fully benefit from the lesson.

Another student who did not feel the graphic organizer helped mcuh was a 6th grader with no disabilities. In this case, the teacher candidate designed a lesson with apparently misaligned goals and activities. He used the same set of photos for the Visual Labeling Strategy, asking the student to scan the photos and give captions first with teacher help and then do it over again

independently. The purpose of using these photos in this exercise was not clear and the student was consequently frustrated with the lack of relevance of scanning and captioning the photos and the learning about the topic itself.

The students of the second group of teacher candidates also rated high on the survey item reflecting the roles the visual images and graphic organizers had played in helping them understand the content better. There was only one exception. This student was a seventh grader with limited English proficiency. His reading and writing levels were both below the 7th grade level. Identified as an at-risk student and English language learner, this student received reading support three times a week. He agreed with the statement "I would be more likely to pay attention to pictures in history texts in the future" and "the use of pictures and graphic organizers has made reading history texts easier and more meaningful." He chosen "I don't know" when asked separately about if the visuals and graphic organizers helped him understand the content better.

A further look at other data indicated that the teacher also employed many other text sources. Not much time was actually devoted to the processing of the visual images. This calls into question the enactment of the teacher candidate's impelementation of the visual literacy curriculum in the lesson. Another important thing to notice was the use of films in the lesson. It was reported in the teacher candidate's reflection that the student benefited more from watching the two documentary films she used for this lesson: "Since English is his second language, watching both films and hearing the words being spoken in the films, and watching the scenes, pictures, and maps in the films made it easier for him to learn from than all of the text materials." Visuals, films, and other media can all contribute to diverse learners' access to content. It might

well be that, besides the instructional reason mentioned earlier, the film media was a better source for promoting UDL learning for this student.

Visual Literacy Curriculum Engages Students

A close analysis of the data suggests that the teacher candidates who most successfully engaged their students in the lessons understood that the visual literacy curriculum consisted of two major components: visual images and graphic organizers. They understood how to integrate these two parts in ways allowing them to be mutually supportive. Visual images and graphic organizers were designed as integral parts of the visual literacy curriculum, just two sides of a coin or of a building roof, as figure 10 suggests. The successful lessons were characterized by the adoption of the visual literacy curriculum as what it represented—an approach to content reading that focused on inquiry through visual images and other learning sources such as print media to provide a guided reading experience.

As such an approach, the visual literacy strategies should be used to provide the students with opportunities to utilize visual and written texts as well as their background knowledge to generate questions and answers, have discussions, practice dialogues relevant to the topic, take notes and organize information through the graphic organizers, and formulate ideas for evaluation and interpretation. Students would gain more knowledge through a guided practice.

This focus on inquiry should lead to successful engagement of the students through the visual images and graphic organizer strategies embedded in the curriculum, thus contributing to the implementation of UDL in the lessons.

In fact, the study found some common attributes across the lessons that resulted in the teacher candidates' successful integration of the visual literacy curriculum. Figure 10 illustrates

the most important functions served by the visual images and graphic organizers in the engaging
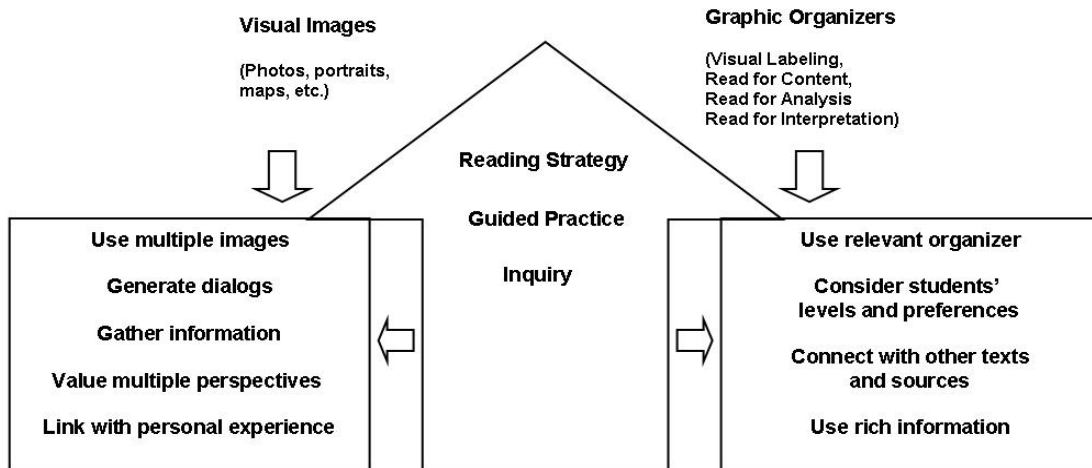
lessons.

FIGURE 10 *Strategic Uses of Visual Literacy Strategies in the Lessons*

The left side of the figure showed the ways that visual images were used in the successful

lessons. Use of multiple images was helpful to draw out more information from the students than

use of one single image. For example, in a lesson on Chicago's stockyards history, the teacher

candidate first used one relevant primary source photo and asked the students what they thought

a stockyard might be. Based on this single photo, the students' reaction indicated that they were

awed at how big the stockyards seemed. Then, more pictures were shown on the PowerPoint to

the students. The teacher candidate wrote down in her teaching reflection note that these students

were able to come up with various responses for the same questions she asked about the topic.

The students were also able to understand that sometimes either answer would make sense from

what was seen in the photo. This lesson really emphasized student dialog about the visuals and sharing of multiple perspectives. As a result, the students pointed out to the teacher candidate during the after-lesson survey that "they had not realized how much they could learn by looking at pictures, analyzing them, and discussing them."

That the students were allowed to relate to the visual images through their personal experiences also served to engage the students successfully in the lessons. One student came from Mexico. When first asked to do this lesson at first, the student was not interested. But he quickly became actively engaged when he was asked to read the photos and tell what information he could glean from the visuals. As the teacher candidate put it: "He had much to say about the people. He guessed, based upon their appearance." This visual-based activitiy allowed the student from a culturally and linguistically diverse background to use his funds of knowledge to participate successfully in the lesson.

Data analysis also shed light on the specific functions served by the visual images and questions posted on accompanying graphic organizer sheets in the successful lesson implementations. Table 2 lists the various functions the visual literacy curriculum strategies have served to enable the students to be engaged in the learning process.

TABLE 2 *Visual Image Functions in Lessons*

Functions	Examples
Activate student background knowledge	After asking students if they had ever heard of the Chicago stockyards and no one seemed to know, the teacher candidate projected an early 1900s photo of cattle pens in the Chicago stockyard and asked what the students thought a stockyard might be. The teacher was "impressed that the

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	simple picture opened up so many more responses."
Provide tangible information related to content to assist in reading	Asked students to examine the photos more carefully. The students were able to grasp new information from the photos. A 2nd grade student struggling with attention deficit disorder enjoyed using the photos to complete the graphic organizers. "After we read we talked about the article and the photos and filled in the Reading for Interpretation worksheet. He was able to communicate the theme I chose." (excerpt from lesson implementation reflection)
Label and locate specific locations on a map	A student who was especially drawn by the interactive map on the Internet and use the zoom in and out function to locate specific areas.
Create conversations about a topic	A teacher candidate used several pictures about the Great Chicago Fire to engage the student in talking about the event and discussing the details gleaned from the pictures.
Generate questions about the topic	Student was first asked to label a picture. Then the student proceeded to make a list of four questions about this picture.
Activate interest in the content and provide personal connections	A student became interested to learn more about the topic after he was shown a picture and encouraged to read the caption. Used pictures of immigrant neighborhoods in Chicago to relate to the student's personal life and experience.

The right side of Figure 10 showed important ways that the graphic organizers had been used to facilitate students' participation in the lessons. When choosing strategies, many teacher candidates used Visual Labeling Strategy as a way to start the students with reading and interpreting the visual images. Then, they could use Reading for Content Strategy graphic organizer as a tool for students to think about the historical context conveyed in the image(s), including time and place, important people and actions involved in an event. The third strategy Reading for Analysis and the fourth strategy Reading for Interpretation used increasingly complex questions to help the students organize their inferences, evaluate their understanding, and construct important meanings.

Successful uses of the graphic organizers meant appropriate selection of the graphic organizers and the sequence they were used. The results showed that the Visual Labeling Strategy was placed appropriately as the first strategy to engage the students in careful reading and scanning of the content on the visuals. But depending on the background knowledge and general levels of literacy performance of the students, the teacher candidates should judiciously select the other graphic organizers. Sometimes, the teachers may move from Visual Labeling directly to the Reading for Analysis Strategy if the students were able to make good inferences about the topic under study and organize what was read from the visuals during the task involving the Visual Labeling Strategy.

It was very important for the teacher candidates to base the completion of graphic organizers upon more than one learning source. Although this was emphasized with the participants and a salient reminder exists on the graphic organizers, not all of the candidates understood this point until after the implementations. When teacher candidates did not allocate sufficient time for their students to discuss and draw information from both the visual sources

and the text source, they would find that the students did not have enough information for them to complete the graphic organizers, especially the Reading for Analysis and Reading for Interpretation strategies. Therefore, realizing that the graphic organizers serve as a bridge of texts and information sources is an influential factor in the successful participation of the students in the lessons.

Visual Literacy Strategy and Student Expression

Universal design for leanring environment uses instructional tools and methods that also promote alternative and accessible means for student expression, or ways for students to demonstrate what they know.

The visual literacy curriculum provides an inquiry-oriented method that focuses on both visual images and written texts as sources of information, which are integrated through the graphic organizers for meaning construction and interpretation. Throughout this process, the students in the study were given various scaffolds to express their thoughts and demonstrate their knowledge.

For example, a fourth grader who had phonemic awareness difficulties and received special education services was quick to respond to the lesson when she saw the first picture and labeling organizer sheet. At one point during the graphic organizer activity, she proceeded to make a list of four questions about the focal picture. Her teacher candidate reported in the reflection that this student was really into thinking about the picture and coming up with thoughtful questions. This was a student who normally would not enjoy reading texts for information, and yet she took an active role generating thoughtful questions based upon a visual image. It indicated her willingness to demonstrate her learning and express her thoughts in the content reading process.

The visual literacy curriculum helped create windows of entry into the topic by allowing the students to make connections. For instance, for a sixth grader who was diagnosed with Attention Deficit/Hyperactivity Disorder and dyslexia, the visual images and the subsequent use of the Reading for Content Strategy graphic organizer afforded him the right tools to feel that he could understand what was being learned about. The teacher candidate later reflected: "the student performed so well during the lesson because it contained two valuable elements: the use of visual learning strategies and the connection of the lesson material to the student's own life."

Many similar scenarios happened during the teacher candidates' implementation of the lessons. The connected use of visual images and graphic organizers allowed the students to be able to show their understanding and experience success from the outset of the lessons. It suggests that the visuals and graphic organizers had provided alternative means for the students to understand the content and demonstrate what they had learned to the teachers.

The discussion of the common attributes across successful lessons indicates the usefulness of the visual literacy curriculum in general, implying that the strategies are viable tools for engaging diverse learners in a process of using alternative tools to help them become active participants, understand content, and make sense of history and social studies topics. Meanwhile, the results indicate that teaching with the visual literacy curriculum is most effective when teachers follow an inquiry and guided-practice model of instruction.

Conclusion

This paper discussed the results of a field-based study examining two groups of teacher candidates' implementations of a visual literacy curriculum as required for their preclinical field experience project. The purpose of the study was to explore whether the visual literacy

curriculum was a viable instructional tool that teachers could use to implement UDL in their teaching to diverse learners.

In order to engage students with diverse needs in learning history and social studies content, teachers need to create learning environments and curriculum guided by the Universal Deisgn for Learning Framework. UDL is anchored towards proactive planning of instruction premised upon the three basic principles of instruction: multiple means of presenting knowledge, engaging learners, and allowing them to demonstrate their knowledge.

Findings from the study shed important light on the viability of the visual literacy curriculum as a practicable and flexible method conducive to the creation of UDL lessons. On the one hand, the UDL framework can serve as a guideline for teachers to incorporate adaptive teaching elements that reduce the need for retroffitting a curriculum. By anticipating instructional barriers and considering students' individual needs for adaptations and accommodations at the beginning, teachers can set students up for success. The results of the study affirmed the importance of using UDL approach before implementing the visual-oriented lessons.

On the other hand, the visual literacy curriculum, because of its inherent properties, made it a very viable tool for the teacher candidates in this study to implement lessons that provided alternative means of presentation, engagement in learning, and student expression. The students, who were frustrated by print-dominated teaching due to their disabilties and other special needs, were eager to be involved in the visual-oriented lessons. The visual literacy curriculum has allowed the students to use visuals as venues for accessing the content and constructing meanings through dialog, personal connections with the varieties of texts, and scaffolded learning through the graphic organizers.

Through this study, the teacher candidates developed a new appreciation for the role visual images and graphic organizers could play in teaching diverse learners, including students with mild disabilities and limited English proficiency. The teacher candidates were convinced through the fieldtest project that the visual literacy strategies had enriched their UDL tool kit and prepared them for teaching diverse learners.

There are certainly limitations to the exploratory study. The first limitation was that the teacher candidates had limited time to familiarize their students with the visual literacy curriculum through one lesson. Given extended time, the lessons could have shown more impact on the knowledge learned by the students. But this would be a focus of future studies. Another limitation of the study was that most of the teacher candidates focused on one student for the project. Therefore, the results of the study were not intended for situations that involve regular classrooms. However, the findings revealed that the visual literacy curriculum had been implemented with positive responses from students displaying a variety of special needs. This suggests that the curriculum has strong potential to facilitate the development of UDL-based classroom environments where a wide range of learning profiles exists.

Future studies will investigate the implementation of the visual literacy curriculum in general education classrooms and the impact it has on all learners' participation and progress in the general educaiton history and social studies curriculum.

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