

Spiral Techniques for Teaching Interpretation at Higher Education: Quantitative Research

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Abstract

This quantitative, quasi-experimental research is aimed at investigating the impact of spiral teaching techniques on students' performance in interpretation. Data was collected using a pretest-posttest designed for a sample of level 7 undergraduate students in the College of Languages and Translation, at Imam Muhammad Ibn Saud Islamic University. Data collection instruments also included a Likert scale questionnaire to document the problems of interpretation. A sample of 100 students was selected randomly to respond to the questionnaire's 30 items. Data analysis included a thorough analytical examination of students' interpretations using a rubric that comprises seven categories for examining interpretation skills, including content delivery, language fluency, memory, speed, note-taking, time management, and managing lab equipment. The language category includes three subcategories, namely listening comprehension, language structure, and pronunciation and voice expression. The results of data analysis pointed to a significant difference between the overall scores of the students' pretest and posttest, indicating the positive impact of spiral techniques on students' performance. Data analysis of students' recording and note-taking revealed the advantages of spiral teaching techniques for enhancing students' cognitive abilities, including attention, retention, and motivation. The current research discussions cover a wide range of topics such as narrowing the gap between interpretation theories and

practice, interpretation teaching and training, and the procedures for implementing the spiral approach. The recommendations emphasize the importance of adopting constructivist approaches in teaching interpretation. The significance of this research derives from being a contribution in the field of interpretation at higher education as it is one of the first studies to integrate the constructivist spiral theory into interpretation theories so as to enhance students' lab training and, as a result, can lead to improving their performance. The spiral note-taking technique is another contribution in interpretation teaching and training.

Key words: Interpretation; Constructivist approach; Note-taking; Spiral teaching techniques

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INTRODUCTION

Interpretation is a relatively new discipline that has been included in the curriculum of translation studies at higher education in the past few decades. Interpretation is the process of expressing the meaning of oral speeches from one language to another to facilitate communication among people who speak different languages. The rapid increase of conference interpreting in politics, economics, medicine, law, media, and education has led to an upsurge in the demand for interpretation. Colleges of languages and translation studies all over the world have shown significant interest in developing interpretation courses to meet society needs. However, due to the complexity of the interpretation process as a cognitive science, using traditional teaching methods that depend mainly on direct instruction does not help students become efficient

interpreters. The different modes of interpretation, which encompass sight, bilateral, consecutive, simultaneous, relay, and whispered interpretation, require adopting new teaching approaches that focus on enhancing students' cognitive abilities. The traditional methods of teaching interpretation rely on direct instruction, which is centered on understanding the differences between source and target languages, neglecting such important issues as the working memory, note-taking, and problem-solving, which are crucial for achieving efficient interpretation. Hence, exploring new cognitive teaching methodologies that deal with the multifarious process of interpretation is inevitable. Cognitive teaching methods embrace problem-based and project-based approaches techniques, workshop-based strategies, apprenticeship practices, and spiral techniques, among others. Examining such methods would open new avenues for improving interpretation teaching and training. Therefore, the objective of this quantity, quasi-experimental research is to investigate the spiral approach for teaching interpretation

A. Problem Statement

Students at the College of Languages and Translation at Imam Mohammed Bin Saud Islamic University complained that using traditional teaching methods and classroom management strategies did not help them to acquire the skills they needed to become efficient interpreters. Students complained that since the current interpretation class is the only course in their academic plans, they had to receive adequate training to acquire the interpretation skills in a short period of time. Students reported problems involving storing and retrieving information, writing down notes, managing the interpretation time, and interpreting paralinguistic, all of which affected their competence. Students expressed dissatisfactions with the current teaching methods of interpretation. Evidence from students' exam records indicated that the students' performance was declining. Additional evidence from previous research (Cowan, 2000; Dunning & Holmes, 2014, Gile, 2009; Jones, 2014; Kriston, 2012; Lambert, 2004; Nolan, 2012; Wei, 2002) showed that ineffective teaching methods impacted students' performance negatively

B. Purpose Statement

The purpose of this quantitative, quasi-experimental research was to examine the impact of spiral teaching techniques on students' performance in interpretation. Using pretest-posttest scores, the study focused on providing statistically significant relationships between using constructivist spiral methodologies and students' performance. Research (Anderson, 2004; Brewer & Daane, 2002; Bruner, 1974; Camayd-Freixas, 2011; Olson, 2014; Schunk, 2004; Shreve & Angelone, 2010; Sternberg, 2012) indicated that using spiral constructivist methods impacted students' cognitive abilities. Quantitative data was collected from the undergraduate students in the College of Languages and Translation at Imam Mohammed bin Saud Islamic University. Data was

analyzed employing the Statistical Package for the Social Sciences (SPSS). The data analysis report provided solutions to the research problems to help students improve their interpretation performance

C. Assumptions

This research was based on the assumption that spiral teaching methods, which stem from the learning theories of constructivism, impact students' performance in interpretation. Engaging students in real-life experiential learning environments where learners construct new knowledge motivates them to acquire refined interpretation skills that are required to become successful interpreters. Adopting the spiral methods in interpretation teaching would provide students with effective training to enhance their cognitive abilities. Integrating the spiral teaching techniques into theories of interpretation would also bridge the gap between theory and practice. By employing spiral teaching techniques, undergraduate students would be intrinsically motivated as they would be able to understand the relationship between cognition and the process of interpretation.

D. Definitions of Terms

Bilateral Interpretation: Refers to work in two directions, moving back and forth between two languages to carry out the interpretation tasks. Bilateral interpreting is linked with liaison interpreting and dialogue interpreting (Pochhacker 2014).

Consecutive Interpretation: Occurs when the interpreter listens to the whole speech, or a part of it, then reconstitutes the speech with the help of notes taken while listening (Jones, 2014).

Interpretation: Is the process of re-expressing the meaning of a message from one language into a different language through spoken words (Jones, 2014).

Relay: Refers to the use of one interpretation in consecutive and simultaneous interpretation, as a source for others; and it is used in situations where a meeting is multilingual. The interpreter who provides the source speech for other interpreters is called the relay (Jones, 2014).

Sight Interpretation: Combines interpretation and translation as the interpreter reads aloud the interpretation of the source language text to the target language audience (Jones, 2014).

Simultaneous Interpretation: Interpreters render the source speech simultaneously while the speaker speaks (Jones, 2014).

Spiral Technique: An approach of learning used in education when the core concepts are taught, then, as learning progresses, secondary concepts are learned, enhancing, thus, the long-term memory (Bruner, 1966, 1974, 1991).

Whispered Interpretation: Involves the interpreter sitting or standing next to the person who needs interpretation to render the speech through whispering in the speakers' ears (Jones, 2014).

E. Significance of the Study

This research is a contribution to the field of interpretation of higher education as it is one of the first studies to integrate the constructivist spiral theory into interpretation theories so as to enhance students' lab training and, consequently, can lead to improving their performance. The study targeted a crucial issue, which is employing constructivist instruction in interpretation. The spiral note-taking technique, introduced by the researcher, is another contribution to interpretation teaching and training.

F. Limitations and Delimitations

Due to cultural constraints, the current research depended on using a sample of only feeble undergraduate students, who study one course of interpretation in College of Languages and Translation, at Imam Mohammed bin Saud Islamic University. Therefore, the research did not represent the majority of students, and the degree of objectivity might have affected the data of this research. Therefore, further studies in the integration of spiral techniques and interpretation need to be conducted to prove that traditional methods are ineffective in teaching interpretation of higher education. However, the study has the potential to be replicated in other institutions.

G. Theoretical Framework

The theoretical framework of this research is based on an integration of education spiral theory and theories of interpretation. The spiral theory depends on theories of constructivism. Brewer and Daane (2002) noted that constructivism treats knowledge as concepts that students can construct through their own experiences. In this regard, Bruner's (1961, 1974, 1991) constructivist theory is grounded on a spiral model for instruction that views learning as discovery. Bruner's spiral model is used to keep cycling the information through motivation, engagement, and discovery. Bruner asserted that discovery learning is cognitive because it involves investigating, inquiring, and constructing knowledge. Instruction, thus, should aim at stimulating students to search for, manipulate, and explore new knowledge to solve-problems. In spiral techniques, learning is not sequential, but curved when learners move upward, downward, and inward to understand and formulate knowledge. Hence, the spiral technique is more effective pedagogically than traditional teaching methods because the spiral model is integrative, allowing linking theory into practice.

Theories of interpretation, including, Rozan's (2004), Lederer's (2014), Gile's (1991, 2000, 2009), Seleskovitch's (1994, 1999), Jensen's (1985), Pochhacker's (1995, 2004), Jones (2014), among others, are compatible with spiral constructivism. Rozan's theory for effective interpretation contains three phases, including: listening and comprehension; analysis and note-taking; and reconstitution and interpretation. Seleskovitch's and Lederer's interpretative theory are centered on understanding the cognitive and situational context of the interpretation process. Seleskovitch's

theory of sense depends on manipulating and constructing knowledge to help interpreters deliver the speeches accurately. Pochhacker's (1995, 2004) functionalist simultaneous theory focuses on the communicative context which determines the functional characteristics of the speech. Gile's theory (1999) of *effort model* highlights the interpreters' communicative competence. Moreover, Jensen (1985) proposed a transformational-generative theory to help interpreters convert the speaker's thoughts and expressions, applying macro and micro analysis. Such interpretation theories focus on the task of reconstitution, i.e. reconstructing the messages of the original speech, as intended by the speakers, using the characteristics of the target language, after overcoming any linguistic or cultural barriers. Hence, the link exists between such theories and the spiral constructivist theory.

1. LITERATURE REVIEW

The review of literature addresses the current research questions regarding the impacts of spiral teaching methods, which are constructivist approaches, on students' performance in interpretation. Constructivism is a meta-concept that applies to the development of analytical and critical thinking within the framework of various teaching strategies, including the spiral techniques. The literature review contains topics on the relationship between constructivism and interpretation theories, and the strategies applied for helping interpretation trainees enhance the working memory, strengthen communicative competence, and use effective notation.

1.1 Theories and Practices of Interpretation

The main concern of interpretation is the unit of meaning. The unit of meaning is the cognitive representation in the interpreter's mind of the intended meaning of the speaker formed from the spoken words (Jones, 2014). Interpretation is the process of re-expressing (i.e. reconstructing) the meaning of a speech into different languages, using various modes (Nolan, 2012). Modes of interpretation include sight, bilateral, consecutive, simultaneous, relay, and whispered interpretation. The functionalist theories of interpretation, including those of Gile, Jones, Pochhacker, and Seleskovitch, view interpretation as a complex communicative event. Jones (2014) discussed two principles for overcoming this complexity: deducing the meaning from context; and increasing knowledge of source languages. To achieve efficient reconstruction of the original speech(s), Camayd-Freixas (2011), Gile (2009), Jones (2014), Nolan, (2012), Obst (2011), Rennert (2010), and Rozan (2004) indicated that interpretation requires important skills which encompass knowledge of source and target languages, memory, language fluency, speed, active listening, note-taking, and time management. Moreover, interpreters must be trained to recognize and render paralinguistic

features, such as the use of facial expressions, gestures, and nodding.

Jensen's (1985) theory focuses on abstracting the meaning, thoughts, ideas, and images so that interpretation can be comprehensible and informative in a natural way. According to Jensen, the original speech words are abstracted into a-lingual concepts, called *schema*. Jensen's interpretation process contains five principles: Empathic analysis, referring to abstracting the meaning (lingual, images, ideas, thoughts); segment recognition, which is the shortest possible unit of unambiguous meaning; managing the *décalage*, which is the amount of time (measured in ideas or segments) that the simultaneous interpreter lags behind the original speaker; formulation, which refers to comparison, adjustment, self-monitoring; the reception phase (decoding the incoming source message); and delivery, pointing to the production phase (encoding the outgoing target language message). Jensen's formula of interpretation is: I (Interpretation) = L (Listening) + A (Abstracting) + F (Formulating) + M (Monitoring) = D (Delivering). Jensen, thus, introduced a *transformational-generative model* of interpretation.

Gile's (1999) theory of *effort model* for interpretation deals with the mental operations underlying the interpreting tasks, to understand the cognitive processes by distributing attention among the components of the model, emphasizing the significant role of short-term memory in interpreting. Gile argued that interpreters are competent only when the total available processing capacity is larger than the capacity requirements. Gile's *effort model* consists of four efforts, which include: Listening and analysis effort (concerning all comprehension-oriented operations, including identification of words, and the final decisions about the meaning of the utterance); memory effort (the storage mechanism for preserving the information before further processing takes place); production effort (understanding the utterance while taking notes and delivering the speech); and coordination effort (managing the attention between the listening and analysis task, and the ongoing self-monitoring that occurs during performance effort). Thus, Gile's consecutive interpretation formula is as follows: CI (Consecutive Interpreting) = L (Listening) + N (Note-taking) + M (Memory) + C (Coordination). Gile's formula of simultaneous interpretation is as follows: SI (Simultaneous Interpretation) = L (Listening) + P (Production Effort) + M (Memory) + C (Coordination). The key concept of the *effort model* is to enhance the processing capacity, which means that some mental operations in interpreting require a significant amount of energy.

Seleskovitch's (1994) *theory of sense* was built on three stages in the process of the *sense*: the understanding of the *sense*; a de-verbalization of the *sense*; and the reformulation of the *sense* in the other language.

According to Seleskovitch, sense is based on the cognitive complements of individual listeners or interpreters; therefore, its depth varies depending on the knowledge and the experience of each individual verbal, situational, and cognitive context. Seleskovitch believed that the *theory of sense* emphasized interpretation as a creative task. Seleskovith (1999)'s strategies related to enhancing memory include shadowing exercises. Seleskovith (1999) defined shadowing as "repeating the word of speech in the same language" (p.62). Shadowing helps students to develop processing capacity since it includes retelling, visualizing, and anticipating exercises. In this respect, Obst (2011) argued that efficient interpreters use three major tools to accomplish the interpretation tasks effectively, namely, anticipation, visualization and note taking.

Jones (2014) argued that the consecutive interpreter's task contains three stages, namely: understanding; analyzing; and re-expressing. According to Jones, interpreters must increase knowledge on the linguistic, psychological, and sociological factors that are involved in various situations where interpretation is used. For enhancing the working memory, Jones advocated the strategies of labeling and tagging the speech statements, using association of ideas, and mnemonic exercises. Jones suggested some techniques for acquiring interpretation skills, including the *salami technique*. The salami technique involves slicing up a long or complicated sentence into shorter, more comprehensible sentences during the interpreting process.

1.2 Techniques and Principles of Note-Taking

Siantova (2015) indicated that the schools of thought concerning notation include the Geneva School, the Paris school, and the Heidelberg school. The Geneva school led by Rozan emphasized that using notes, interpreters should only translate the meaning and not word by word. Rozan (2004) introduced seven principles to achieve effective notes. The seven principles are: noting the idea not the word; verticality; shifting; abbreviation; links; negation, and emphasis. Rozan argued that it is important to always note the negation, the sequence of ideas, and links amid them. Rozan affirmed that links are important for they not only connect the ideas together but also help to anticipate what the next idea could be.

The Paris school contains Seleskovitch's studies which emphasize the distinctions between the meanings and sense of individual words. Seleskovitch asserted the importance of taking-notes on monosemantic words, such as names, numbers, and listing. Seleskovitch differentiated between two kinds of notes, namely, untranslated words, and concretely translated words. Similarly, Jones (2014) identified three types of information that interpreters must note. Firstly, numbers and dates, which should be given top priority because they are abstract and too difficult to remember; secondly, proper names of people, countries, places, organizations,

etc.; thirdly, lists of chemicals, medicines, diseases, products, etc.. Zhong (2003) suggested four tactics for notation, including: categorization (grouping items of the same properties); generalization (drawing general conclusions from the message); comparison (noting differences and similarities of events); and description (describing scenes, shapes, or objects).

The Heidelberg School embraces Heinz Matyssek. Matyssek (cited in Siantova, 2015) introduced a number of symbols pertinent in note-taking techniques that could be applied through the use of margin, verticalism, and negation. Obst (2011) pointed out that managing note-taking requires three significant motor skills: noting symbols, noting abbreviations, and speed writing. In this regard, Nolan (2012) argued that writing each word is a major distraction that could affect active listening and non-verbal communication, therefore it is important to start “reducing words into ideas and putting the ideas into symbols that can then be re-expressed in another language” (p. 278).

Jones (2014) concluded that interpreters can either use a common system of symbols or develop their own systems as long as the symbol is kept simple. Symbols can be one letter of the word, like the word *Need* represented as just N, and the word *Know* represented as K. Some symbols are just geometrical shapes such as a circle with a dot in the middle to mean *See*, or a square with a small circle at one of its four sides to mean *Open*. Rozan (2004) noted that words should be shortened to maximum 4-5 letters by omitting the middle vowels. For example, the word “elevator” becomes “elvt”. Rozan noted that words should be shortened to maximum 4-5 letters by omitting the middle vowels. For example, the word “elevator” becomes “elvt”. Noting words with suffixes and prefixes is easy using abbreviations such as “_ize,” “_ion” and “_ive”, etc.. Jones (2014) argued that notation techniques include linear note-taking to outline the speech, or non-linear notes in the form of charting or mapping. Nolan (2012) concluded that note-taking is a selective approach which focuses on meaning through rapid speech scanning.

1.3 New Trends in Teaching Methodologies

An analysis of traditional and new methods of teaching interpretation shows that while traditional methods focus on linear, short-term learning and test-based assessment, new teaching methods are centered on using non-linear approaches, life-long learning, and authentic assessment. New methods of teaching are based on the learning theories of attention, perception, encoding, storage, and retrieval of knowledge (Gredler, 2005), which are all cognitive abilities needed for assisting students become efficient interpreters. Schunk (2004) noted that brain research asserted that multifaceted process of learning captures the actual progressive state of learning. Research (Marshall, Sears, & Schubert, 2000; Marshall, Sears, Allen, Roberts, & Schubert, 2007; Marsh & Willis, 2003) emphasized the importance of identifying the disparities

between theoretic representations and real classroom situations. According to Posner (2004), conceptual differences are based on a distinction between a curriculum as the expected *ends* of education, i.e., the intended learning outcomes, and curriculum as the expected *means* of education, i.e., instructional plans. Brookhart (2004) noted that curriculum is most productively conceived based on several factors, including: the study of individual differences (e.g. educational psychology, theories of learning and motivation); the study of groups (e.g. social learning theory, cooperative learning); and the study of measurement (e.g. validity and reliability theory, formative and summative assessment theory). Bruner (1974) asserted that an effective curriculum should be founded on cycling the information through discovery, and construction of knowledge. In the light of these approaches, Watson (2001) outlined the principles that describe the constructivist teacher. The constructivist teacher encourages students’ autonomy; uses manipulative teaching methods and interactions to motivate students become independent and life-long learners. Jin (2011) emphasized that training students should not be only by giving instructions, but it should be based on motivating students to solve problems, and make appropriate decisions.

1.4 What Is the Spiral Teaching Approach?

Spiral techniques shift the focus from using traditional ways of learning which are centered on memorization, and direct instructions, into adopting cognitive and metacognitive tactics that endorse analytical and reflective thinking, memory, attention, retention, intrinsic motivation, and social interactions. Bruner (1991) argued that the spiral teaching method refers to learning progression which is not linear, but rather spiral, i.e. moving upwards, downwards, and inwards. According to Bruner, spiral teaching addresses four major aspects: predisposition towards learning; methods of structuring knowledge; effective learning activities; and authentic assessment. The theoretical idea of the spiral approach is to revisit the concepts of the subject, allowing students to construct their own understanding. Spiral teaching is based on moving upward explaining the subject matters, then returning to the main concepts constantly to add more analysis. Bruner believed that effective methods for structuring knowledge should result in simplifying and generating new propositions, and increasing the manipulation of information (see Figure 1).

1.5 Spiral Teaching in Interpretation

Figure 1 shows how teachers can use the spiral approach which entails levels of abstraction from complexification, which is deductive and analytic, to simplification, which is inductive and constructive so as to create interconnectivity between abstract knowledge and real world experience. The spiral approach is appropriate for teaching interpretation because it provides a framework for explaining the

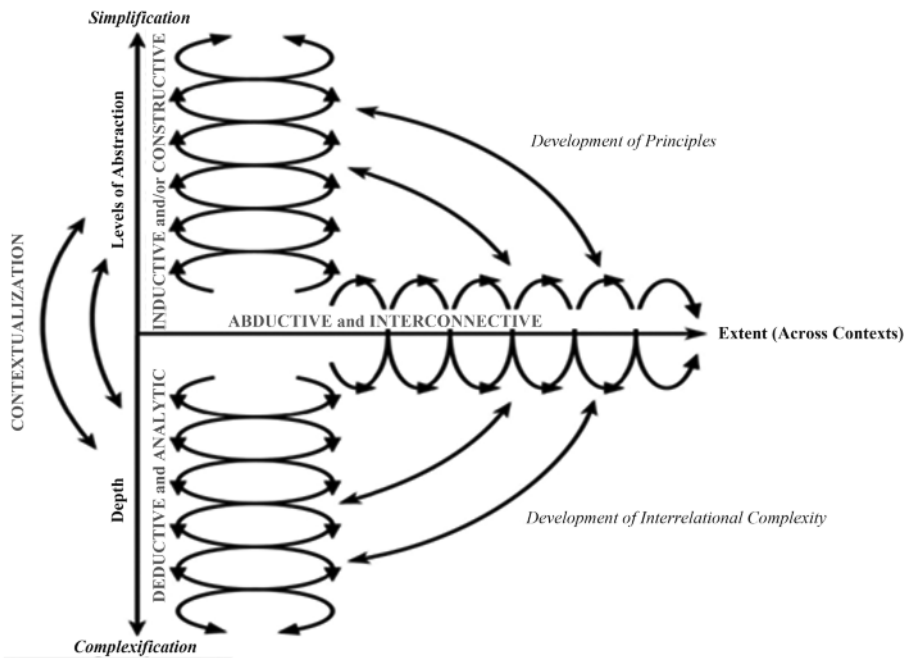


Figure 1
The Spiral Model (Bruner, 1974)

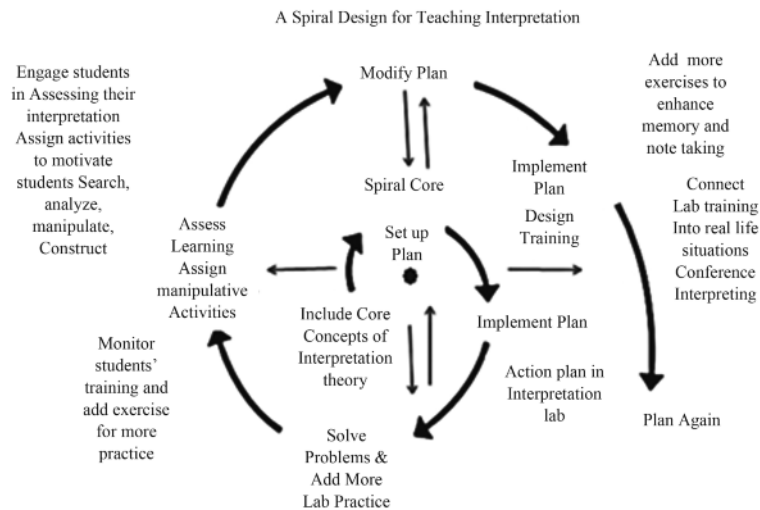


Figure 2
A Spiral Plan for Interpretation Lab Training

concepts with “hands on” the interpretation audio materials. Using spiral teaching can allow teachers to duplicate the benefits of laboratory training through engaging students in repeated activities that focus on memory enhancement, active listening, and note-taking. The spiral model serves teachers’ goals of linking theory of interpretation to practice, as displayed in Figure 2.

Figure 2 shows how teachers can begin by setting up the instructional plan which should include lab training, strategies to discuss interpretation theories, notation techniques, and exercises to acquire interpretation skills. Progressing in a spiral movement, teachers will be able to identify students’ problems to modify or increase training

in the lab. Moving upward with more complex concepts, and coming downwards to the fundamentals, is a practical technique to scaffold students’ learning. Moving inward along the curved spiral is an effective tactic to intensify students’ training

2. DATA ANALYSIS RESULTS AND DISCUSSIONS

2.1 Research Questions

- a) What are the impacts of spiral teaching techniques on students’ interpretation performance?

b) What is the relationship between spiral techniques and interpretation?

c) What is the statistical relationship between spiral teaching techniques and students' grades in interpretation?

2.2 Research Hypothesis

There is a statistical relationship between spiral teaching techniques and students' performance in interpretation. The *null hypothesis* is: There is no statistical relationship between spiral teaching techniques and students' performance in interpretation.

2.3 Research Method and Instrumentation

Data collection instruments included a Likert scale questionnaire to document the problems of interpretation, students' academic records, and pretest-posttest. A sample of 100 students was selected randomly to respond to the questionnaire's 30 items. The Interpretation pretest-posttest was selected from the audio archives of Voice of America (VOA, 2015). The test was given to a sample of 20 undergraduate female students in the College of Languages and Translation, at Imam Muhammad Ibn Saud Islamic University. The small sample allowed a thorough analysis of each participant's interpretation, using a rubric, designed by the researcher. The rubric consists of seven categories for examining interpretation skills, including: content delivery; language fluency; speed; memory; note-taking; time management; and managing lab equipment. The language category includes three subcategories: listening comprehension; language structure; and pronunciation and voice expression. A deduction of 1 mark was applied to each error. The participants took the pretest to examine their performance based on the traditional teaching method currently used in the classrooms. After 32 hours of lab training which consisted of 8 hours per week for four weeks using the spiral techniques, the participants took the posttest. The pretest-posttest scores were recorded in the rubric for data analysis that contained comments on each student's performance. The audio test was about USA new law of food safety.

2.4 Results

Using the Statistical Package for the Social Sciences (SPSS), the questionnaire data analysis pointed to a

significant difference between the overall scores of the participants' pretest and posttest, demonstrating the positive impact of spiral techniques on students' performance. Data analysis of students' recording and note-taking also revealed the advantages of spiral teaching techniques for enhancing students' cognitive abilities, including strengthening the working memory, identifying the patterns of sequential relations in audio materials, using the segmental procedures in note taking, and implementing the symmetry process in acquiring new interpretation skills.

To validate H_1 , "There is a statistical relationship between spiral teaching techniques and students' performance in interpretation," the researcher used the one sample *t*-test to find out if there is any statistical significance. Data analysis results indicated a statistical significance at the level of 0.1 as the 2-tailed significance is less than 0.1 and the *t* values of items exceed that of *df*(99) which is 2.6264. Thus, the *null hypothesis* "there is no statistical relationship between spiral teaching techniques and students' performance in interpretation." is rejected.

The participants' profiles revealed their language levels and the extent of their satisfaction with the traditional teaching methods. Based on participants' GPA, the percentage of participants with advanced language level reached 36%. The advanced level refers to language scores between 99-85 out of 100. The percentage of participants with intermediate language level reached 64%. The intermediate level points to language scores between 84-70 out of 100. Data analysis also indicated that only 14% of participants were satisfied with the traditional teaching methods. Only 24% of participants felt they were ready to work as interpreters, which indicated that students encountered problems in interpretation training. Table 1 shows the participants' responses regarding the problems of interpretation.

Table 1 shows that 88% had problems with notation, 59% indicated inability to concentrate and remember the information, 54% had problems due to lack of training, and 34% indicated problems with time management. Moreover, the analysis of pretest-posttest scores revealed a significant difference in the scores, reflecting evidence of improvement of students' performances after employing the spiral technique. Table 2 displays the results.

Table 1
Participants' Interpretation Problems

Problem	Frequency	Percent	Valid percent	Cumulative percent
Speed of speech	14	14.0	14.0	14.0
Time management	20	20.0	20.0	34.0
Lack of training	20	20.0	20.0	54.0
Memory	5	5.0	5.0	59.0
Notation	10	10.0	10.0	88.0
Language problems	12	12.0	12.0	100.0
Total	100	100.0	100.0	

Table 2
Pretest-Posttest Results

Participant #	Pretest scores	Posttest scores	Improvement %	Participant #	Pretest scores	Posttest scores	Improvement %
1	4	7	30%	11	4	7	30%
2	4	8	50%	12	3	5	30%
3	5	8	30%	13	5	8	30%
4	4	6	20%	14	6	9	30%
5	3	6	50%	15	4	7	30%
6	4	7	30%	16	5	9	40%
7	5	8	30%	17	4	7	30%
8	3	6	50%	18	4	8	50%
9	5	8	30%	19	6	9	20%
10	5	8	30%	20	6	9	30%

Using a rubric, the pretest-posttest scores were analyzed. As shown in Table 2, the highest score in interpreting the audio posttest is 9 points out of 10 while the lowest score is 5 points out of 10. The measures of central tendency showed that the mean of the pretest result is 4.25 and the median of the odd numbers is 5 and for the even numbers is 4.5 while the mode is 4. The mean of the posttest result is 7.5, and the median of the odd numbers is 7 and for the even numbers is 8.5 while the mode is 8. Table 1 also shows that 95% of the participants (19 out of 20 participants) improved the skill of note-taking, and 90% (18 out of 20 participants) improved the working memory, and 80% (16 participants out of 20) improved interpretation speed. The overall improvement of participants' skills was 20% to 50%, which indicate that there is a positive impact of spiral techniques on students' performance. Furthermore, the analysis of the rubric results revealed the quality of the participants' interpretation. Table 3 displays the results.

Table 3
Participants' Interpretation Quality

Criteria	Pretest	Posttest	% of Improvement
Fluency of delivery	25%	90%	65%
Content consistency	40%	85%	55%
Utterance logical cohesion	50%	85%	35%
Correct terminology usage	50%	90%	45%
Pronunciation/voice expression	50%	90%	40%

As displayed in Table 3, the participant's interpretation quality was also affected by the application of the spiral technique. A comparison between the pretest-posttest scores indicates that interpretation fluency improved by 65% whereas interpretation content consistency improved by 55%. The quality of utterance logical cohesion, and the use of correct terminology improved by 35% and 45%, respectively. The quality of pronunciation and voice expression showed an improvement of 40%.

2.5 Results of Note-Taking Skills

An analysis of participants' pretest results indicated that 75% (15 out of 20 participants) used linear note-taking, and 25% (5 out of 20 participants) used non-linear note-

taking such as mapping and charting. The posttest analysis of note-taking skills showed that 80% (16 out of 20 participants) used the spiral notation technique. Figure 3 displays samples of the participants' notes.

As shown in Figure 3, participant # 12 used a linear notation technique, which is similar to outlining. Using bullets were not helpful enough to note all the main points of the speech. Another limitation of linear note-taking is that it is difficult to insert new information among the large blank spaces in the page without confusing the sequential order of the information. This participant's brief notes also affected the content and speed of interpretation. Chmiel (2010) indicated that taking notes can be a real distraction to an untrained interpreter who can easily have attention diverted from the speech message. Brief notations affect the ability to render the whole speech. Jones (2014) asserted that interpreting is fundamentally the art of re-expressing.

Figure 3 shows that participant # 9 used non-linear notes in the form of mapping the ideas of the speech. The participant used a tree structure to link the small pieces of the information in a coherent way. However, the limitation of the mapping technique is that it is time-consuming. This participant did not take adequate notes, which resulted in facing problems with delivering the whole content of the speech. Meifang (2012) asserted that notation affects the capacity of short-memory. Gillies (2014) indicated that note-taking techniques determine interpretation consistency and efficiency.

Figure 3 also displays the notes of participant #8, who used the note-taking spiral technique effectively. Based on her test scores, the spiral note-taking helped her to raise her score by 50%. As displayed in Figure 3, she used the core of the spiral to note the topic of the speech (USA Food Safety), then she moved around the spiral curve to write down the secondary ideas. The advantage of spiral note-taking is that it allows a sequential ordering of ideas along the curve line, in addition to using symbols and numerical information. Another advantage of spiral notation is that it allows moving the note paper in any direction, to add or look for information. So, notation becomes dynamic. The spiral technique helped to store and retrieve information easily, which resulted in maintaining the interpretation speed.

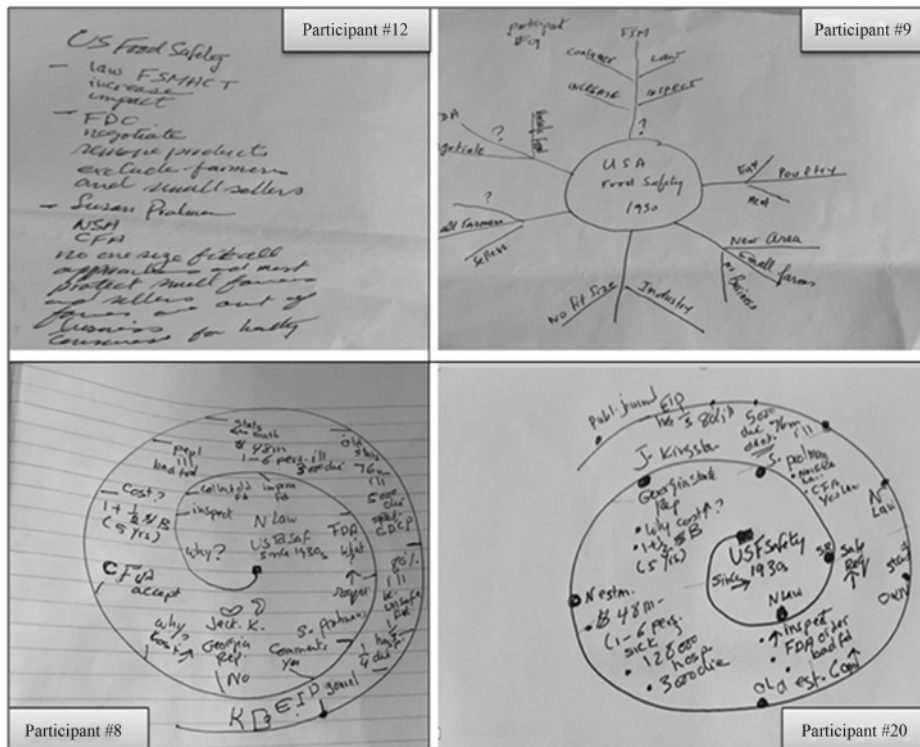


Figure 3
Samples of Participants' Notes

As shown in Figure 3, participant # 20 also used the spiral note-taking technique creatively and effectively, and managed to improve her interpretation skills by 30%. This participant used big bullets to note the main ideas, and small dots to write down the supporting information. In addition, using symbols, shapes, and numerical signs such as 80% ill, to represent eighty percent of illnesses, and the symbol “N” which means “Need”, and the shape of a circle with a dot inside to represent the concept of “Inclusion”, helped to stimulate her working memory during the task of interpretation. Such an effective note-taking technique allows grasping the main concepts of the speech, and arranging its segmentation smoothly. In this regard, Jones (2014) asserted that successful notation techniques prevented distraction; enhanced concentration, and facilitated comprehension and speech analysis.

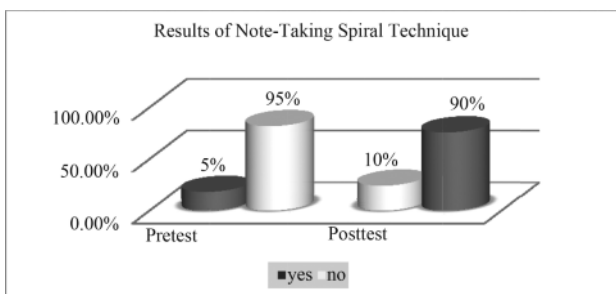


Figure 4
Results of Note-Taking Spiral Technique

2.6 Discussions

Findings from data analysis showed that the participants who did not take memory and notation training had problems understanding the speech. A comparison of the pretest-posttest scores show evidence that the spiral technique allows participants to organize their notes, enhance their working memory, and manage the interpretation time efficiently. Figure 4 shows participants' successful use of spiral note-taking.

As displayed in Figure 4, only 5% of participants were able to make effective use of their interpretation notes prior to training while 90% of participants were able to develop their skills, including speed, memory, and time management, after the training sessions. The participants were able not only to listen actively to grasp the message of the speech, but also segmented the speech by breaking down the main ideas into conceptual words. In harmony with these results, Kriston (2012) concluded that encoding of information takes three forms, namely, acoustic, visual, and semantic; however, the actual function of short-term memory begins with the hearing of sounds, indicating the importance of intensifying lab training.

The statistical evidence that resulted from data analysis revealed that the spiral techniques impact students' competence positively. Data analysis showed that the spiral technique is simple to use and useful for enhancing the working memory. In this connection, Dunning and Holmes (2014) stated, “training participants explicitly to use strategies facilitates increases in short-

term memory and working memory performance” (p.855). Moreover, the spiral approach helped students to enhance their cognitive abilities while accelerating their concentration to note the information along the curve.

The rationale behind using the Spiral Notation Technique (SNT) is to follow the movement of the spiral curve while placing the high value word in the spiral centers, then write down the minor words, using abbreviation or symbols around it as the spiral opens up wide. The spiral curve also permits noting vertically. During the training, students can focus on one area at a glance, which eases the eye and the hand movement simultaneously. The spiral technique facilitates moving along the curve backward, forward, and inward to retrieve the information quickly. Hence, the spiral curve can also be used as a mnemonic tool to enhance memory through an open curve circle that fosters association of ideas, segmentation of speech, and generation of information, which is the main tasks of interpretation.

3. IMPLICATIONS AND RECOMMENDATIONS

The current research findings are consistent with findings from previous research in education and learning theories, which indicated that spiral learning is effective for constructing knowledge and acquiring refined skills. Adopting spiral teaching approaches in interpretation can help students explore their cognitive potentials to overcome the difficulties that hinder them from developing interpretation competence. Therefore, the recommendations, presented here, target interpretation

teaching and training. The first recommendation is to replace the traditional teaching methods that are used in teaching interpretation by adopting the spiral approach to engage students in active learning. Secondly, integrating the spiral model into interpretation training will assist students in strengthening the working memory, in taking notes effectively, and in solving complex problems successfully. Thirdly, by linking theory to practice, teachers will be able to guide students to understand the conceptual and practical phases of the interpretation process. Fourthly, increasing the number of interpretation courses at higher education can provide society with professional interpreters. The current research findings demonstrate the importance of memory training; therefore, equipping interpretation laboratories with the most recent technology can help teachers to design training plans using the spiral technique. Using the spiral technique will enable teachers to *scaffold* students who underperform in interpretation. Figure 5 shows how teachers can use the spiral teaching model.

As shown in Figure 5, teachers start with identifying students’ problems, then select audio materials that can motivate students to explore, inquire, manipulate, and construct information. Teachers can add new audio materials while moving down the spiral to assist students to enhance their interpretation skills; then provide more practice in the laboratories to ensure that students develop their cognitive abilities. Teachers can design new plans to move downward on the spiral curve to revisit the essential concepts of interpretation. Moving upward again in the curve, can allow teachers to apply more sophisticated materials while urging students to analyze and construct new knowledge. The spiral model encompasses strategic

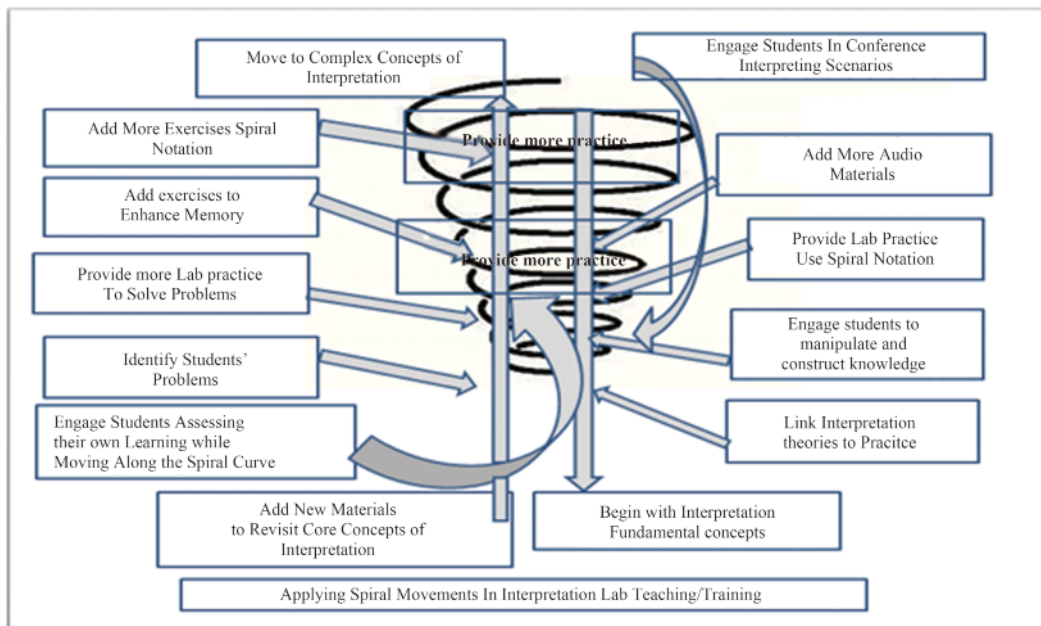


Figure 5
Applying Spiral Teaching in Interpretation Classroom

movements in various directions to help teachers identify students' problems, set improvement action plans, provide continuous practice, select new audio materials to enhance training, and connect fundamental concepts of knowledge to subcategories of analysis and construction of new knowledge. The recurrence movements along the spiral curve increase the learning opportunities and, consequently, students' performance will improve. Spiral learning urges students to become active and independent learners, capable of understanding, transforming, and constructing new knowledge (Bruner, 1961, 1974, 1991).

CONCLUSION

This quantitative, quasi-experimental research focused on examining the impact of spiral teaching techniques on students' performance in interpretation. A pretest-posttest was employed to investigate the problems of interpretation from a sample of undergraduate female students in the College of Languages and Translation, at Imam Muhammad Ibn Saud Islamic University. Data analysis revealed that the overall improvement of students' skills in interpretation was 20% to 50%, indicating the positive impact of spiral techniques on students' performance. An analysis of students notes, based on using the spiral mode, showed that 90% benefited from the spiral note-taking technique. In the spiral design, learning materials are re-visited repeatedly to ensure that all students progress steadily; thus, the spiral method scaffolds students interpreters who face difficulties in improving their performance. The findings of this research are compatible with previous research results reported in the review of the literature, which points to the advantages of spiral learning to stimulate students' cognitive abilities. The recommendations proposed in this research include a spiral model that can be integrated in the interpretation curriculum to guide teachers in implementing the spiral technique which endorses constructivism as an avenue for interpretation teaching and training. As such, this research is a contribution in the field of interpretation at higher education as it is one of the first studies to integrate the constructivist spiral theory into interpretation theories so as to enhance students' lab training and, consequently, can lead to improving their performance. The spiral note-taking technique, introduced by the researcher, is another contribution in interpretation teaching and training. This research also shows how by linking theories to practice, students can understand the interpretation as a cognitive process.

REFERENCES

Anderson, J. R. (2004). *Cognitive psychology and its implications* (6th ed.). New York: Worth Publishers.

- Brewer, J., & Daane, C. J. (2002). Translating constructivist theory into proactive in primary grade mathematics. *Education*, 123(2), 416-423.
- Brookhart, S. M. (2004). Classroom assessment: Tensions and intersections in theory and practice. *Teachers College Record*, 106(3), 429-458.
- Bruner, J. S. (1961). *The act of discovery*. Cambridge, MA: Harvard Educational Review.
- Bruner, J. S. (1974). *Toward a theory of instruction*. Cambridge, MA: Belkapp Press.
- Bruner, J. S. (1991). *Acts of meaning*. Cambridge, MA: Harvard University Press.
- Camayd-Freixas, E. (2011.) Cognitive theory of simultaneous interpreting and training. *Proceedings of the 52nd conference of the American Translators Association*. New York: ATA.
- Chmiel, A. (2010). How effective is teaching note-taking to trainee interpreters? *The Interpreter and Translator Trainer*, 4(2), 233-250.
- Dunning, D., & Holmes, J. (2014). Does working memory training promote the use of strategies on untrained working memory tasks? *Memory & Cognition*, 42(6), 854-862.
- Gile, D. (1991). The processing capacity issue in conference interpretation. *Babel*, 37(1), 15-27.
- Gile, D. (1999). Testing the Effort Models' tightrope hypothesis in simultaneous interpreting: A contribution. *Journal of Linguistics Hermes*, 23, 153-172.
- Gile, D. (2000). *Issues in inter disciplinary research into conference interpreting: Language processing and simultaneous interpreting*. Amsterdam: John Benjamins Publishing Company.
- Gile, D. (2009). *Basic concepts and models for interpreter and translator training* (1st ed.). Amsterdam: John Benjamins.
- Gillies, A. (2014). *Note-taking for consecutive interpreting: A short course*. New York: Routledge.
- Gredler, M. (2005). *Learning and instruction: Theory into practice* (5th ed.). Upper Saddle River, NJ: Prentice Hall.
- Jensen, P. A. (1985). SI: A note on error typologies and the possibility of gaining insight in mental processes. *Meta*, 30(1), 106-113.
- Jin, Y. (2011). *Cognitive processing capacity management in the teaching of consecutive interpreting*. Auckland, New Zealand: The University of Auckland Press.
- Jones, R. (2014). *Conference interpreting explained* (2nd ed.). New York, NY: Routledge.
- Kriston, A. (2012). The importance of memory training in interpretation. *PCTS Proceedings Professional Communication & Translation Studies*, 5(1), 79-86.
- Lederer, M. (2014). *Translation: The interpretive model* (New version). New York: Routledge.
- Marsh, C. J., & Willis, G. (2003). *Curriculum: Alternative approaches, ongoing issues* (3rd ed.). Upper Saddle River, NJ: Pearson.
- Marshall, J. D., Sears, J. T., & Schubert, W. H. (2000). *Turning points in curriculum: A contemporary memoir*. Upper Saddle Creek, N. J.: Prentice Hall.

- Marshall, J., Sears, J., Allen, L., Roberts, P., & Schubert, W. (2007). *Turning points in curriculum: A contemporary American memoir* (2nd ed.). Upper Saddle River, NJ: Prentice-Hall.
- Meifang, Z. (2012). The study of note-taking and memory in consecutive interpretation. International conference on education technology and management engineering. *Lecture Notes in Information Technology*, 16-17.
- Nolan, J. (2012). *Interpretation: Techniques and exercises* (2nd ed.). Bristol, Buffalo, Toronto: Multilingual Matters.
- Obst, H. (2011). *The art of interpretation*. Indiana: AuthorHouse.
- Olson, D. R. (2014). *Jerome Bruner: The cognitive revolution in educational theory*. New York: Bloomsbury Academic Library.
- Pochhacker, F. (1995). Simultaneous interpreting: A functionalist perspective. *Hermes, Journal of Linguistics*, 14.
- Pochhacker, F. (2004). *Introducing interpreting studies*. New York: Routledge
- Posner, G. J. (2004). *Analyzing the curriculum* (3rd ed.). New York: McGraw Hill.
- Rennert, S. (2010). The impact of fluency on the subjective assessment of interpreting quality. *The Interpreters' Newsletter*, 15, 101-115.
- Rozan, J. F. (2004). *Note-taking in consecutive interpreting*. Krakow: Tertium.
- Schunk, D. (2004). *Learning theories: An education perspective* (4th ed.). Upper Saddle River, NJ: Prentice Hall.
- Seleskovitch, D. (1994). *Interpreting for international conferences: Problems of language and communication* (revised ed.). New York: Pen & Booth.
- Seleskovitch, D. (1999). The teaching of conference interpretation in the course of the last 50 years. *INTP*, 4(1), 55-66.
- Shreve, G., & Angelone, E. (Eds.). (2010). *Translation and cognition: Recent developments. ATA Scholarly Monograph Series XV*. Amsterdam, Philadelphia: John Benjamins.
- Siantova, G. (2015). Consecutive interpretation and note-taking from the perspective of some translation schools and researchers. *International Journal of Scientific Research and Innovative Technology*, 2(1).
- Sternberg, R. J., & Sternberg, K. (2012). *Cognitive psychology* (6th ed.). Belmont, CA: Cengage.
- Voice of America. (VOA, 2015). *Audio archives*. Retrieved from <http://www.voanews.com/>
- Watson, J. (2001). Social constructivism in the classroom. *Support for Learning*, 16(3), 140-147.
- Wei, L. (2002). Positive transfer: A neuropsychological understanding of interpreting and the implications for interpreter training. *Translation Journal*, 6(3).
- Zhong, W. (2003). Memory training in interpreting. *Translation Journal*, 7(3).