Chapter 3 Methodology

The chapter describes the research design of the study in five respects: subjects, instruments, treatment in the preposition instruction, procedures of the study and methods of data analysis.

3.1 Subjects

Two second-grade classes of English Grammar in Chupei High School were chosen as the subjects of the study. One class was assigned as the control group and the other as the experimental group. The two groups were comparable in two respects: their academic achievement on the English course in the previous mid-term examination and their performance on the pretest didn’t show significant difference, as shown in Table 3.1 and Table 3.2. Accordingly, the two groups were considered to be at an equivalent proficiency level, and thus could serve as the foundation for comparison.

Table 3.1 \( t \)-test Result for the Midterm Examination by Control Group and Experimental group

<table>
<thead>
<tr>
<th>GROUP</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>df</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>36</td>
<td>66.1389</td>
<td>13.3248</td>
<td>68</td>
<td>-.079</td>
</tr>
<tr>
<td>Experimental</td>
<td>34</td>
<td>66.4118</td>
<td>15.4393</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3.2 \( t \)-test Result for the Pretest by Control Group and Experimental Group

<table>
<thead>
<tr>
<th>GROUP</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>df</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>36</td>
<td>42.3611</td>
<td>13.4953</td>
<td>68</td>
<td>-1.039</td>
</tr>
<tr>
<td>Experimental</td>
<td>34</td>
<td>45.5882</td>
<td>12.4781</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The control group, consisting of 36 humanities majors (12 males and 24 females; all humanities majors), received preposition instruction based on the traditional
approach. The experimental group, made up of 24 humanities majors and 10 science majors (15 males and 19 females; 10 science majors and 24 humanities majors), received preposition instruction based on the cognitive semantic approach.

3.2 Instruments

Three kinds of instruments were utilized for preposition instruction and also for data collection, as follow:

(1) Materials for preposition instruction

(2) Pretest, posttest I and posttest II on preposition comprehension and application

(3) Questionnaire on students’ responses to the preposition instruction

Each of the instruments is described in detail below.

3.2.1 Materials for the preposition instruction

Materials for the experiments came from a variety of sources: Far East New English Grammar¹, Book I and Book II of the Far East English² and the English dictionary³. The Far East New English Grammar was used for both groups in Instruction I to brush up on English prepositions, including in, on, at, before, after, by, for, to, through, toward, within, around, beside, against, behind, below, above, between, among, near, over, under, along, across, into, off, up and down. The prepositions along with their corresponding graphs were meant for a brief instruction on their spatial senses. They were taught to both groups in Instruction I. Besides, the English textbooks were used to elicit all of the in, on and at phrases, which students had learned in their freshman year. These phrases were adopted either as example

¹ Far East English Grammar was the textbook for the English Grammar course. The textbook, consisting of 10 chapters, introduced English prepositions in Chapter 10.
² The second-year students had studied Book I and Book II of Far East English in their freshman year.
³ Macmillan English Dictionary for Advanced Learners of American English was adopted to meet the need of the study. The dictionary is an unabridged edition, which aims to cover a full range of multiplicity of uses that many common words have.
sentences for the instruction or as question items for the tests. (See Appendix A) Moreover, the English dictionary was referred to for information of prepositions *in*, *on* and *at*, including their definitions and illustrations. The definitions would be taught to the students for a complete understanding of the three prepositions. Part of the illustrations would serve either as example sentences in the instruction or as question items in the tests.

In Instruction II, two types of presentation of the materials were adopted for different approaches, i.e. traditional approach and cognitive approach, to investigate their effects on the preposition teaching/learning. For the control group, all the senses of prepositions *in*, *on* and *at* were presented in a way consistent with the layout in the English dictionary. (See Appendix B) For the experimental group, the presentation was different. The varying senses of a preposition were introduced based on their relativity across the concreteness/abstractness continuum along metaphorical extensions. (See Appendix C)

In the process of metaphorical extensions, image schemas are mapped from one domain to a more abstract domain. This also accounts for metaphorical extensions in a variety of uses of a preposition. However, among all the senses of a particular preposition, which are more concrete and which more abstract? Put in another way, what is the appropriate sequencing of concreteness/abstractness? Heine et al. (1991) observed a robust tendency in the procession of categorical metaphors. It is as follows:

**PERSON > OBJECT > ACTIVITY > SPACE > TIME > QUALITY**

In this configuration, BODY is placed at one end of the continuum while QUALITY occurs at the other end of the continuum. According to Heine et al., the extension from PERSON to QUALITY is unidirectional even if any of the categories is missing. It always proceeds from left to right, i.e. from concrete to abstract, in the procession
of metaphorical extension.

This scale conforms to general human experience when people interact with the environment. Take *in* for example, little kids get to know the concept of ‘in’ when they put food in their mouth and when they feel that the food is in their body. After that, they extend this TR-LM relation to a toy and a box. When they are told that the toy is ‘in’ the box, they know that it is enclosed in the box just like food is enclosed in their body. Later on, when they interact with other people in games, they gain the concept that they are in an activity. Subsequently, they establish the concept of space through activities, which usually take place within certain boundary. After that, they learn to extend the TR-LM relation of ‘in’ to an abstract concept, time, and then to an even more abstract domain, quality.

When applied to the case of English preposition, this framework enables sequencing of the varying uses of a particular preposition. When these uses are accordingly arranged on a continuum, one end of the continuum is PERSON, the most concrete domain and the other end is QUALITY, the most abstract domain. Take preposition *in* for example. Provided that all *in* expressions have extended from its notion of PERSON, to those of OBJECT, ACTIVITY, SPACE, TIME and finally QUALITY, they stretch across a continuum, as illustrated below:

- a piece of candy in the mouth > candy in the box > candy in the game >
- candy in the store > candy in 2005 > candy in fashion

One thing to be noticed is that it is not practicable to classify them into six discrete categories. For instance, in the expression *She locked her jewels in the safe* the TR-LM organization is easily located in the domain of OBJECT, with *the jewel* located in an object as boundary. But the TR-LM organization in *The children in the picture were playing hide-and-seek* falls somewhere beyond OBJECT in a more abstract domain, say SPACE.
The materials, with sequenced senses of *in*, *on* and *at* for the experimental group, were also inspired by Boers and Demecheleer (1998). They adopted a cognitive semantic approach to teaching prepositions. According to them, cognitive semantics could be helpful in a pedagogical context. For one thing, it provides access to tracing the conceptual links between different senses of a preposition. Also, ‘motivating metaphorical extension may help [educators] present the semantics of a [preposition] in a way that facilitates comprehension (p. 203).’ In an attempt to clarify the conceptual links, they demonstrated how a spatial sense is extended to its figurative senses by means of conceptual metaphors. The following is a set of examples sequenced with graded levels of abstraction.

- *the man behind the wheelbarrow*
- *the man behind the wheel of the company*
- *the people behind the strike*
- *the reason behind the crisis*
- *the assumption behind the theory*  
  (pp. 200-201)

The spatial sense of *behind* is to describe situations where a trajector is hidden by a landmark. With two conceptual metaphors *SEEING IS KNOWING* and *NOT SEEING IS NOT KNOWING* at play, the first figurative sense of *behind* is motivated, as in the phrase *the man behind the wheel of the company*. Further, a second figurative sense is motivated by the conceptual metaphor *ABSTRACT SUPPORT IS BACKING UP*, as in the expressions *the people behind the strike*, *the reason behind the crisis* and *the assumption behind the theory*. With these examples in array, learners’ attention can be directed from a spatial sense to its figurative extensions. As such, the conceptual metaphor serves as a link between the various senses of *behind*. Provided with conceptual links between the spatial sense and its figurative uses, learners’ comprehension of figurative senses may be facilitated. Based on these assumptions,
Boers and Demecheleer advanced the suggestion that, when teaching a preposition, teachers pay extra attention to features that hint at its metaphorization and offer learners an appropriate sequence of examples.

The materials based on a cognitive point of view were also inspired by Boers (2000a, 2000b). Boers (2000a) reported that drawing learners’ attention to the literal senses can enhance comprehension. Boers (2000b) reported the potential benefits of organizing figurative expressions according to their underlying metaphoric themes. From a cognitive perspective, figurative language can be motivated. The figurative usage is derived from their literal senses and exploits their imagery. That is to say, a wide range of figurative expressions can systematically be traced back to a limited number of source domains or metaphoric themes.

To summarize, the teaching material for instruction on the spatial sense of in, on and at for both groups was as offered in the grammar textbook. As a follow-up to Instruction I, the materials for Instruction II covered whole packs of definitions of in, on and at as provided in an unabridged English dictionary. A set of prepositional phrases, abstracted from the English dictionary, were presented to the students. The control group received notes on the prepositional expressions as presented in the dictionary. The experimental group received the same input, with the exception that here the expressions were categorized along their degrees of metaphoric abstractness.

### 3.2.2 Pretest, posttest I and posttest II on comprehension and use of prepositions

The pretest and the posttests were intended to assess the students’ ability in using

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4 In the study, three language learning experiments were carried out. In view of their results Boers proposed a few classroom activities aimed at raising learners’ metaphor awareness. Accordingly, the cognitive approach is meant as a complementary technique.

5 Some recurring metaphoric themes can be employed as an alternative type of lexical field to reveal to learners the structure and organization of figurative language which may at first sight seem to be largely arbitrary. (Kövecses and Szabo 1996, Lazar 1996)
prepositions, especially in, on and at and also to determine and compare the effects of preposition instruction with/without metaphor instruction.

The pretest included multiple-choice test and fill-in-the-blank task (See Appendix E). Posttest I included multiple-choice test and fill-in-the-blank task (See Appendix F). Posttest II included fill-in-the-blank task (See Appendix H). In these tests, the question items that contain in, on and at are the targeted items. These questions are meant to test the students’ ability in using in, on and at in their diverse senses, ranging from spatial, temporal to even more abstract senses. For ease of comparison, some question items are reproduced in the following table:

<table>
<thead>
<tr>
<th></th>
<th>Pretest</th>
<th>Posttest I</th>
<th>Posttest II</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Spatial sense</strong></td>
<td>Mom put a lot of chocolate bars in the box.</td>
<td>Look! There are a lot of birds in the tree.</td>
<td>Little Monkey loves playing in the tree.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Temporal sense</strong></td>
<td>The police finally found the missing diamond in June.</td>
<td>They finally got married in June.</td>
<td>He went back to his hometown in 2001.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>More abstract senses</strong></td>
<td>Do you know purple is in fashion this year?</td>
<td>With the typhoon approaching, their lives are in danger.</td>
<td>Who will protect you when your life is in danger?</td>
</tr>
<tr>
<td></td>
<td>The audience clapped loudly in appreciation at the end of the concert.</td>
<td>When I came into the house, they all sat in silence.</td>
<td>Step aside and let him pass. He is in a hurry.</td>
</tr>
<tr>
<td></td>
<td>So far, more advanced robots are not in common use.</td>
<td>Mr. Brown is an expert in cooking as well as gardening.</td>
<td>He held his brother in a tight manner.</td>
</tr>
</tbody>
</table>

6 The spatial sense here corresponds to the notion of body, object, activity and space in the framework adopted for the present study, i.e. BODY>OBJECT>ACTIVITY>SPACE>TIME>QUALITY, for the four notions are comparatively more concrete than time and quality and they are all related to space.

7 The temporal sense corresponds to the notion of time.

8 More abstract senses refer to the notion of quality.
3.2.3 Questionnaire on students’ responses to the preposition instruction

To investigate the students’ responses to the preposition instruction carried out in the treatment, we devised a questionnaire that consisted of three open-ended questions (See Appendix G). These questions aimed to elicit the students’ attitudes toward the teaching approaches adopted in the preposition instruction and also to identify their perception of difficulties from English prepositions. The questionnaire was administered to the students after the treatment. The results yielded in the questionnaire were intended for a comparison with those obtained in the tests.

3.3 Treatment

The treatment consists of two hours of preposition instruction, one hour for Instruction I and the other hour for Instruction II. While Instruction I was given after the pretest in the first week, Instruction II was given in the following week. In the first hour both groups received the same instruction based on the grammar course book Far East Grammar as part of their common grammar course. In the second hour, the two groups received different instruction adopting traditional approach and cognitive semantic approach respectively.

3.3.1 The first hour

The first hour of treatment aims at a general review of common prepositions. To relate to and extend from learners’ background knowledge, the instruction focused on the spatial sense of prepositions. Based on the content of Far East Grammar, the prepositions were introduced along with their corresponding pictorial graphs. Take for example prepositions in, on and at, as represented in the following table.
Table 3.3 Spatial function of *in*, *on* and *at* in Far East Grammar

<table>
<thead>
<tr>
<th>Function</th>
<th>Examples</th>
<th>Instruction</th>
</tr>
</thead>
</table>
| *in* denotes location | 1. Many prehistoric fossils can be seen *in* this museum.  
2. Some people like to live *in* the city, because it’s convenient.  
3. Mom put a lot of chocolate bars *in* the box.  
4. The poor deer was trapped *in* the hole. | ‘*in* + location’ means inside something, usually a bigger area of space |
| *on* denotes location | 1. The dictionary is *on* the shelf.  
2. Paul accidentally dropped the hammer *on* his toes.  
3. There is a beautiful painting *on* the wall.  
4. It’s cooler to lie *on* the marble floor in summer. | ‘*on* + location’ means on the upper surface of something, in contact with the surface |
| *at* denotes location | 1. Students learn a variety of things *at* school.  
2. Lines of people are waiting for the bus *at* the bus stop.  
3. I found Lisa *at* the baker’s, because she likes to eat the buns there.  
4. Jack fell in love with Rose *at* his birthday party. | ‘*at* + location’ means a specific place or location |

Following the review of *in*, *on* and *at* in their spatial sense, students continued to receive reviews of the spatial functions of other prepositions. Based on the course book, other prepositions covered in the review included *before*, *after*, *by*, *for*, *to*,

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9 The original graph for preposition *at* in Far East Grammar was in the following:

(p. 362)

The graph was replaced to avoid overlapping with the graph depicting preposition *on*. 

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through, toward, within, around, beside, against, behind, below, above, between, among, near, over, under, along, across, into, off, up and down. These prepositions were also presented in sentences along with their corresponding graphs. Through the first hour of instruction on prepositions in their spatial sense, the students were equipped with basic knowledge of English prepositions, which typically specify spatial relations.

3.3.2 The second hour

Since the students were now familiar with the spatial use of English prepositions, the second hour of treatment, extending from their basic knowledge, aimed at teaching them a pack of uses of prepositions in, on and at as presented in an unabridged English dictionary. Adopted from the dictionary, the teaching material was the same for the students in both groups. However, to investigate the effects of different approaches, i.e. traditional approach and cognitive semantic approach, on the preposition teaching/learning, two types of presentation of the materials were adopted in the second meeting. The traditional approach used for the control group followed the dictionary introducing the various senses of a preposition in a random order. On the other hand, the cognitive semantic approach for the experimental group sequenced the various uses according to their concreteness/abstractness relativity, from the more concrete to the more abstract. Besides different sequencing, the two approaches differed in their use of graphs. While the traditional approach did not use pictorial graphs for non-spatial notions of prepositions, the cognitive semantic approach utilized schematic graphs through the presentation of all the notions from concrete to abstract.

Treatment for the control group

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After the first hour of instruction that covered a brief review of English prepositions, the second meeting focused on the various uses of the prepositions *in, on* and *at*. For the control group, all the senses of prepositions *in, on* and *at* were presented in a way consistent with the layout in the English dictionary. To take preposition *in* for instance, all of its definitions were presented in such an order as sequenced in the English dictionary (See Appendix B). During the instruction, the students received explanations about the definitions and the illustrating sentences. For example, the first definition with two of its example sentences goes:

**1. used for showing where sb or sth is**

*She’s downstairs in the living room.*

Following the first definition is the second definition with an example sentence:

**2. into sth**

*The guard fired a few shots in the air.*

Following that, the third definition is illustrated with several sentences:

**3. used for talking about numbers and amounts**

*There are 2,000 pounds in a ton.*

*The desk is 190 centimeters in width.*

*My father is in his forties now.*

After the third definition comes the fourth along with its illustration(s). In this way, the presentation of *in* expressions proceeds item by item until the last definition. After finishing all the senses of preposition *in*, the instruction went on to cover preposition *on* and finally preposition *at*. The first three definitions of *on* and *at* along with their
illustrations are represented below:

<table>
<thead>
<tr>
<th>on</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. supported by a part of your body</td>
</tr>
<tr>
<td>Can you skate backward on one leg?</td>
</tr>
<tr>
<td>2. in a list</td>
</tr>
<tr>
<td>My name is not on the list of members, why not?</td>
</tr>
<tr>
<td>3. hitting against sth</td>
</tr>
<tr>
<td>She bumped her head really hard on the door.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>at</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. used for stating what sb is doing</td>
</tr>
<tr>
<td>We were at a party last night when you called.</td>
</tr>
<tr>
<td>The country was at war and life was difficult for everyone.</td>
</tr>
<tr>
<td>2. used for stating what sb reacts to</td>
</tr>
<tr>
<td>Audiences still laugh at his jokes.</td>
</tr>
<tr>
<td>3. used for showing prices, temperatures, speeds, etc.</td>
</tr>
<tr>
<td>His car crashed at 140 kilometers an hour.</td>
</tr>
<tr>
<td>The plastic cups will melt at high temperature.</td>
</tr>
</tbody>
</table>

In this way, the two-hour treatment for the control group proceeded until the students received preposition instruction on the various uses of *in*, *on* and *at* along with example sentences illustrative of the uses.

**Treatment for the experimental group**

With the knowledge of the spatial function of prepositions from Instruction I, the experimental group went on with Instruction II to cover a full range of uses of *in*, *on* and *at*. The students were given treatment adopting a cognitive semantic approach, which differed from the traditional approach in that the various uses of *in*, *on* and *at*
were presented in different orders through the instruction. Specifically, the presentation of a whole pack of uses of a preposition was in the order of increasing abstractness. That is, concrete uses were introduced prior to relatively more abstract uses (See Appendix C).

To start with, a warm-up activity was used to activate students’ imagery for the CONTAINER METAPHOR. The students were involved in brain-storming for Chinese zai…li ‘在……裡’ phrases before they were given instruction on English prepositional phrases. The students were led to produce in their mind pictures of a container for the outcome Chinese phrases. The pictured containers ranged from concrete entities to abstract ideas, i.e. proceeding through mouth, belly, box, classroom, activity, time, mind, and memory. The brain-storming was meant to raise learner awareness and to help the learning process since the metaphoric abstractness along which the would-be-taught English prepositional expressions were organized also existed in Chinese, the students’ L1. In this way, the instruction based on a cognitive perspective encouraged learners not only to use the language, but also to reflect upon their uses and characteristics.

Besides, corresponding graphs were presented for the illustration of different senses of a preposition throughout the instruction. With the increasing degree of abstractness depicted in the non-spatial uses, the pictorial graphs served as image schemata for mapping while students were led to construe the expressions carrying abstract senses. To take preposition in for instance, all of the locative uses were illustrated with sentences and a corresponding graph:
She’s downstairs in the living room.

Have you been waiting outside in the rain?

There is a lot of fat in cheese.

She looked beautiful in her wedding dress.

Who is in the new movie with Brad Pitt?

During the instruction the sentences were taught and explained with the corresponding graph. By constantly relating the sentences to and highlighting the TR-LM relation against the graph, the teacher raised students’ awareness of the core meaning that holds in all the illustrations. Following the locative uses, the temporal use of in was also illustrated with sentences, with the TR-LM relation highlighted against the same pictorial graph:

My father is in his forties now.

Referring to graphs helped to reinforce the cognitive point of view that the various senses of a preposition are related. Meanwhile, metaphor instruction was involved to help build up concept mapping from a concrete domain to a more abstract one, from the physical world to become more removed from the domain of physical world. Through metaphorical extension, the core meaning of in as well as the image schema functions as linkage between the various senses with different degrees of concreteness/abstractness across the continuum, from locative senses such as body, object, activity and space to temporal sense and then to even more abstract senses like quality (See Appendix D-2), i.e. from the physical world to become more subjective
or evaluative. Some example sentences of preposition *in* carrying non-spatial and non-temporal senses are in the following:

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Kevin is in trouble again.

She spoke more in disappointment than in anger.

We all sat in silence.

The houses are built in the traditional style.

The desk is 190 centimeters in width.
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To be brief, the example sentences to demonstrate the sequenced senses of a preposition were illustrated with and linked to the corresponding graphs throughout the instruction for the experimental group. The teacher drew the learners’ attention to the source domains of the given expressions and encouraged them to apply imagery in their processing of the expressions.

After the instruction on *in* expressions, *on* expressions and *at* expressions were taught in the same vein. The notion of body was introduced first with examples like *There is a fly on my face* and *Don’t throw stones at me*. Then the TR-LM relation in the notion of body was extended to the notion of object in expressions like *There’s an apple on the table* and *He threw a stone at the ball*. After that, the TR-LM relation was extended to the notion of activity in expressions such as *She is on business in Taipei* and *They were at a party last night*. Then it was further extended to the notion of space (*She is on the train* and *He is at the supermarket*), the notion of time (*New Year’s Day falls on January1* and *The plane took off at 15:55*) and the notion of quality (*I need to turn in a paper on history* and *We complimented Jane on her ability*).

In summary, the instruction based on a cognitive point of view appears to be
desirable because it provides access to systematic learning. This approach is helpful in raising learners’ awareness that abstract senses of prepositional expressions can be motivated and that they can be learned in a systematic way other than rote memory.

3.4 Procedures of the study

The present study was conducted in the following steps:

Step 1: Pilot test

To determine whether the pretest, posttest and delayed test were suitable for the subjects, we administered a pilot test in another second grade class in Chupei Senior High School. The main concerns of the pilot test were the readability of the testing passages and appropriateness of the time limit in the tests.

Step 2: Pretest

The pretest was administered for the control group on December 27th, 2004, and for the experimental group on December 30th, 2004. The subjects were told that the test was to find out their ability to use English prepositions. The test took about 15 minutes.

Step 3: Instruction I

Following the pretest session, the subjects received the first section of preposition instruction. The instruction for both groups was the same, aimed at a brush-up on the spatial use of English prepositions via the textbook, Far East New English Grammar.

Step 4: Instruction II

One week after preposition instruction I, the two groups received the second section of preposition instruction. The control group received instruction II on January 3rd, 2005 and the experimental group on January 6th, 2005. The
instruction for both groups focused on the various uses of prepositions in, on and at. Nevertheless, different types of materials based on different approaches were designed for the two groups. The experimental group received prepositional expressions notes organized along various degrees of metaphoric abstractness. The control group received the same input organized along different semantic lines.

Step 5: Posttest I & Questionnaire

After the preposition instruction session, posttest I was immediately administered for both groups. The subjects were informed that the test was intended to measure the effects of the preposition instruction on their comprehension and use of prepositions. The test along with the questionnaire took 35 minutes.

Step 6: Posttest II

Posttest II was conducted one week after Posttest I, for the control group on January 10th, 2005 and for the experimental group on January 13th, 2005. The subjects were informed that the test was intended to measure their proficiency in English prepositions in, on and at. The test took 15 minutes. The results of the test would serve as a database for students’ difficulty.

Step 7: Data analysis

All the data from the tests and the questionnaire were collected. After that the data were analyzed. The results obtained were presented and interpreted.

3.5 Data analysis

The quantitative data collected from the pretest, posttest I and posttest II were analyzed quantitatively. The data obtained from the tests were computed with SPSS package. Several t-tests were applied to the mean scores of both groups on the pretest,
posttest I and posttest II to compare the effects of the two teaching approaches to the preposition instruction for the two groups.

On the other hand, the qualitative data from the questionnaire on the students’ responses to the application of different approaches to the preposition instruction were quantified following several steps presented by Strauss and Corbin (1990). First of all, we placed each individual entry onto cards. Then we selected a card from the pile, read it and noted its contents. This first card represented the first entry in the yet-to-be-named category. After that, we selected the second card and made a decision on intuitive grounds whether this second card is a look-alike or feel-alike with Card 1. When its contents were essentially similar, we placed Card 2 with Card 1 and proceeded to the third card. Otherwise, the second card would represent the first entry in the second yet-to-be-named category. In this way, we continued on with successive cards until all the cards were processed. Once all the cards were assigned, we devised categories and labels for each of the groups and examined the responses. Thus, all the analyses here aimed to arrive at valid and reliable results.