

Effect of Inductive and Deductive Teaching on Learning English Grammar for Undergraduate Students

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Abstract

Grammar teaching and learning is an important component to get mastery over any language. English language is being taught as first, second or foreign language in many countries. Consider whether inductive or deductive teaching is more effective for learning English grammar as a second language is a topic for contemplation. This study aimed to investigate the effectiveness of inductive and deductive teaching for learning English grammar at undergraduate level. An experimental study was carried out through pre-test post-test control group design. Eighty male undergraduate Urdu speaking students were divided into two equal groups randomly. Group A was taught English grammar – tenses and modal verbs through inductive teaching and group B through deductive teaching method. Pre-test and post-test scores of both groups revealed that group A performed better than group B in learning English grammar – tenses and modal verbs. It reveals that inductive teaching for learning English grammar – tenses and modal verbs at undergraduate level is more effective than deductive teaching. Inductive teaching is recommended for teaching English grammar at undergraduate level.

Keywords: inductive teaching, deductive teaching, learning English grammar, learning modal verbs, tenses, undergraduate students.

Introduction

Language teaching is a complex activity, and grammar is an important aspect of it, defined as the science of language (Jasmina, & Farmonovna, 2023). The structure and system of a language, presented in the form of syntax and morphology, define the grammar of any language (Habibi, 2021). Various methodologies have been suggested for teaching English grammar, but inductive and deductive methods are more familiar due to their distinct features for effective grammar instruction (Mahdi & Ismail, 2023). Blašković (2022) stated that deductive teaching is most common for teaching the grammar of the first language, whereas inductive teaching is preferred for teaching grammar when a language is taught as a second language.

Inductive teaching is a student-centered teaching, where teacher plays the role of a guide and facilitator (Mahdi & Ismail, 2023). It is modern teaching approach for teaching English grammar and it helps to engage all the participants in the class (Abdukarimova & Zubaydova, 2021). While teaching through inductive approach, examples are given first and students are required to derive rules and principles from the examples. Students may have more contextual learning experiences through inductive teaching and it may have long term effect on the learning and create more positive effect on them at this level (Benitez-Correa et al., 2019). Learners may remember rules derived from given examples by comparing them with their contextual setting (Habibi, 2021).

Deductive teaching is teacher centered where teacher tells rules and principles of sentence formation – syntax. Students are asked to form sentences as per rules given to them (Ismail et al., 2023). Teacher remains active participant in the class helping learners to construct new sentences as per rules taught to them because it is difficult for students to construct new sentences independently without contextual learning experiences (Kim & Won, 2020). Studies of Latifjono'g'li (2022) and Lafta (2019) have stated that learning of rules and regulation has always been a difficult task for students and memorized rules forget after a few days. Authors further reported that memorized, having no understanding, rules cannot be applied easily in new situation to construct new sentences.

English teachers teaching in Pakistan face many challenges while teaching English grammar at different levels i. e. secondary school, higher secondary school, undergraduate, and graduate level (Kim & Won, 2020; Munir et al., 2023). They

are in search to find out effect methodologies to meet their challenges. Empirical evidences would help them to select methodologies effective for teaching English grammar (Munir et al., 2023). Literature has suggested inductive and deductive methods effective for teaching English grammar but both have their pros and cons. Which one is more effective for teaching English grammar should be investigated, based on empirical evidence. To answer this question, the present study was designed to find out the effect of inductive and deductive teaching on learning English grammar by undergraduate students. The results of the study would be helping for the teachers who are teaching English language at undergraduate level. Furthermore, the study results would be helpful for undergraduate level students to learn grammar with the help of inductive or deductive methods to improve their English grammar competency. The results would be effective for authors of English textbook to write grammar books on the pattern of inductive or deductive methodologies.

Objectives of the Study

The study was conducted to:

1. Find out the effect of inductive and deductive teaching on undergraduate students' learning of English grammar –tenses.
2. Find out the effect of inductive and deductive teaching on undergraduate students' learning of English grammar – use of modal verbs.

Research Questions

The study was conducted to find the answers of the following research questions:

1. Are inductive and deductive teaching methods effective for undergraduate students' learning of English grammar – tenses?
2. Are inductive and deductive teaching methods effective for undergraduate students' learning of English grammar – modal verbs?

Hypotheses of the Study

Based on the above objectives and research questions, the study tested the following research hypotheses:

Ho₁: There is no effect of inductive and deductive teaching on undergraduate students' learning of English grammar – tenses.

Ho₂: There is no effect of inductive and deductive teaching on undergraduate students' learning of English grammar – modal verbs.

Literature Review

A teaching method refers to the entire process of selecting and using pedagogy, principles, and classroom management strategies for teaching. Teaching method, no doubt, plays a significant role in the teaching learning process. The selection of teaching method solely depends upon the nature of subject being taught, the approach under which a teacher is teaching, and the topic being taught (Nur, 2020).

Teaching a language differs from teaching other subjects, especially when it comes to a second or foreign language. In language teaching, grammar teaching is one of the most important and challenging aspect. Since the emergence of Pakistan, English has been taught as a second language (Noveria, 2021) and has been a compulsory subject from grade I to XIV. Along with other aspects, teaching English grammar has been a difficult task at school and college level (Rauf & Khan, 2022). Inductive and deductive methods are among the various approaches that have been used for teaching English grammar in countries where it is considered a second language (Blaskovic 2022; Habibi, 2021; Rauf & Saeed, 2021).

Inductive and deductive teaching are basically approaches adopted by the teachers in the classroom for teaching English grammar and they are opposite to each other (Nur, 2020). The inductive method proceeds from giving examples to drive rules and principles. This is also known as student centered approach for teaching English grammar (Obeidat & Alomari, 2020). The teacher acts as facilitator and guide and students play an active role in the learning process. Students start figuring out the structure, and grammatical rules from the example by seeking guidance of teacher where needed (Oktambaevna et al., 2020). For example, a teacher writes

some sentences of the present indefinite and past indefinite tenses in the context of students' daily life and asks students to find out the differences between them. While thinking about the differences, students may try to convert them from present simple to past simple. When students try to understand the structure and differences between sentences, the teacher helps them to understand the nature of the differences (Ochoa et al., 2019). Inductive method ensures students' active participation and interaction; activate students' critical and debating skills to learn language; enables students to have deeper and long-lasting understanding of the language structure and formation (Sharofovna, 2021).

On the other hand, the deductive method is a traditional approach for teaching English grammar (Rismayanti, 2021). In this method, teacher plays central role in teaching learning process. It is known as teacher-centered method because teacher tells rules and principles in the class for the derivation of rules and regulations of language formation. Students depend upon teacher's continuous assistance for writing new sentences therefore it is known as teacher centered method. This method also proceeds from general (learning/memorizing rules) to specific (writing examples) (Qizi, 2021). In this method, rules are given first, then country-context examples are given where English has been the first language. For example, under deductive method a teacher writes some principles or rules of present simple and past simple tense formation and students write new sentences based on the rules given (Oktambaevna et al., 2020). Ochoa et al. (2019) have suggested that the deductive method is a passive approach because students remain passive and follow their teacher's guidance. Authors further state that this method is boring for teaching grammar because rule learning is not happy activity for students and it also lacks contextual conditioning of grammatical rules. Sharofovna (2021) has reported a comparison of both deductive and inductive methods that deductive method helps teacher to teach more rules in short time whereas inductive method consumes time in thinking and discussion while deriving rules from the given examples.

Oktambaevna et al. (2020) have described deductive and inductive methods as rules driven and rules discovery methods respectively. Deductive method is rules driven approach where rules govern over their contextual application. Students cannot deviate from the memorized rules while writing new sentences. On the other hand, students discover rules from contextual examples. Rismayanti (2021) wrote that rules derived not memorized from contextual examples are easy to remember

and recall and apply whenever these are required. Author further recommended the effectiveness of inductive method for teaching English grammar where English is being taught as second language.

The present study was designed to find out the effect of inductive and deductive methods for teaching English grammar in Pakistan at undergraduate level. It is a strive to find out the empirical evidences in favour of the methods' effectiveness for teaching English grammar. It would be facilitation for English language teachers to have effective grammar teaching especially tenses and modal verbs at undergraduate level.

Theoretical Framework of the Study

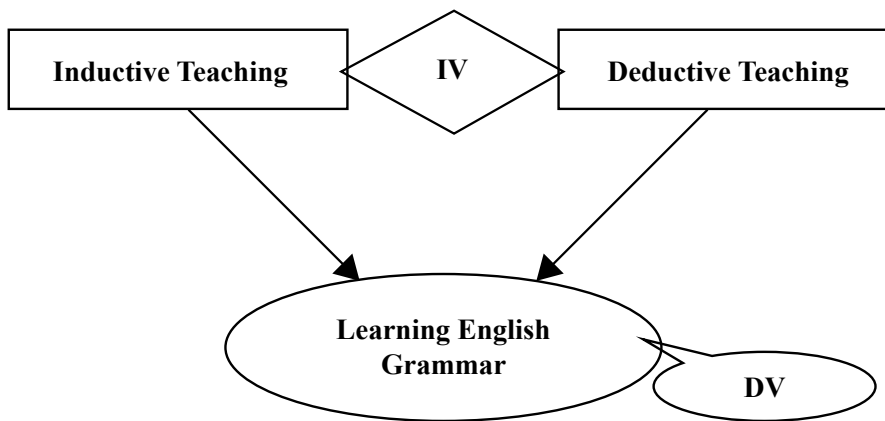
Language teaching and learning is a cognitive phenomenon. Piaget has suggested cognitive development theory which supports the idea of language as cognitive learning (Rauf & Khan, 2022). Similarly, Vygotsky's theory of cognitive development is also the base of this approach of language teaching. Krashen's hypotheses for foreign language teaching focuses on language learning as a cognitive function (Lafta, 2019). Human cognition should be activated for language learning; therefore, the present study falls under the cognitive theories of language teaching and learning.

Conceptual Framework of the Study

Figure 1 shows the conceptual frame work of the study. It shows that there are two independent variables – inductive and deductive teaching and one dependent variable – learning English grammar. Bothe independent variables might have effect on dependent variables. An experimental study was conducted to find out the effect of inductive and deductive teaching on learning English grammar by undergraduate students.

Figure 1:

Conceptual Framework of the Study



Methodology

An experimental study was conducted using a pre-test post-test control group design to determine the effect of inductive and deductive teaching on learning English grammar – tenses and modal verbs. A descriptive research approach was employed, and quantitative data were analyzed to assess the impact of independent variables on dependent variables. The researchers intentionally manipulated the independent variables in a controlled setting.

The present study followed the positivist paradigm so quantitative research method was used to find out the results of the study. Dependent variables were measured through tests (teacher made supply type tests) which were assessed and assigned marks for further process of quantitative analysis.

Sample of the Study

The sample of the study consisted of an intact group of 80 undergraduate students. This undergraduate class was enrolled in the college on the same merit and all the students belonged to the same vicinity and their mother tongue was Urdu. College admission criteria were used for the initial sample selection. These eighty students were divided into two equal groups - group A and B randomly by using random number table. Each group contained 40 students. By tossing a coin, group A was selected for teaching English grammar – tenses and modal verbs through

inductive teaching and group B was selected for teaching English grammar – tenses and modal verbs through deductive teaching. Both groups, A and B, were taught the same content English grammar – tenses and the use of modal verbs, through inductive and deductive methods. Lessons were planned for both groups to teach English grammar – tenses and modal verbs with the help of inductive and deductive methods. Both groups were taught for twelve weeks, five classes per week of 45 minutes period.

Instrumentation

A supply type test was developed to find out the effect of inductive and deductive teaching on learning English grammar – tenses and modal verbs at undergraduate level. Students were asked to find out the mistakes in the use of tenses and modal verbs and rewrite those sentences by correcting their tense and modal verbs. The test, which was worth 20 marks, underwent validation by three experts. Two experts were college teachers who were teaching English as a second language to undergraduate classes for more than ten years. One expert belonged to the university level, having expertise in research. Cronbach Alpha test reliability measure was .80 which was highly recommended for a research study. It was marked as per rubric having one mark for each item/sentence given in the test for correction. The same test was conducted on pre and posttest basis with a twelve weeks gap which is a recommended period to forget previously read information. It should be noted that no revisions were made during this period.

Data Analysis

Data were collected on pre and post-test basis. Collected data were analyzed through paired samples and independent samples t-test. Paired samples t-test was applied to compare the pre-test and post-test scores of the same group. To find out the difference between pre and post test scores between different groups (A and B), independent samples t-test was applied. The detailed analysis as per the research questions and hypotheses of the study is as under.

Findings

Research questions 1

Are inductive and deductive teaching methods effective for undergraduate students' learning of English grammar – tenses?

Ho₁: There is no effect of inductive and deductive teaching on undergraduate students' learning of English grammar –Tenses.

Table 1

Paired Samples t-test Mean Score Comparison of Group A and B on Learning English Grammar – Tenses

Group	Tenses	Mean	SD	t	df	Sig(2.tailed)
A	Pre-test	12.90	.955	16.641	39	.000
	Post-test	16.15	.921			
B	Pre-test	12.53	1.261	8.156	39	.000
	Post-test	14.85	.864			

Note: n = 40, p = 0.05

Table 1 shows statistical values resulted from paired samples t-test mean comparison of group A and B taught English grammar – tenses through inductive and deductive methods of teaching. Comparison shows that group A which was taught through inductive teaching shows better performance in post-test scores as (mean=16.15, SD=.921) than pre-test as (Mean=12.90, SD=.955) conditioned $t(39)=16.641$, $p=.000$). On the other hand, group B that was taught with the help of deductive method also showed improved performance in post test score as (Mean=14.85, SD=.864) than pre-test as (Mean=12.53, SD=1.261) conditioned $t(39)=8.156$, $p=.000$ but not better than group A. It reveals that inductive method for teaching English grammar – tenses is more effective than deductive method of teaching English grammar – tenses.

Table 2

Independent Samples t-test Mean Score Comparison of Group A and B on Learning English Grammar – Tenses

Test	Groups	Mean	SD	t	df	Sig(2.tailed)
Pre-test	A	12.90	.955	1.499	78	.138
	B	12.53	1.261			
Post-test	A	16.15	.921	6.510	78	.000
	B	14.85	.864			

Note: n = 40, p = 0.05

Table 2 shows statistics taken from independent samples t-test after comparison of two independent groups on the basis of pre and posttest basis. Statistics reveals that both groups A and B are equal in pre test scores as (Mean=12.90, SD=.955) and (Mean=12.53, SD=1.261) conditioned $t(78)1.499$, $p=.138$. There is no statistically significant difference between group A and group B performance in pre test scores. It means both groups are equal in pre test performance. Whereas in post-test scores group A performed better than group B as (Mean=16.15, SD=.921) and (Mean=14.85, SD=.864) conditioned $t(78)6.510$, $p=.000$. Group A was taught English grammar – tenses through inductive method whereas group B was taught English grammar through deductive method. Better performance of group A than group B is due to the effectiveness of inductive method for teaching English grammar – tenses. So, it is concluded that the statistical results failed to support the null hypothesis “There is no effect of inductive and deductive teaching on undergraduate students’ learning of English grammar –Tenses.” and the alternate hypothesis is stated as “There is effect of inductive and deductive teaching on undergraduate students’ learning of English grammar –tenses.”. And the answer of the research question “Are inductive and deductive teaching methods effective for undergraduate students’ learning of English grammar – tenses?” is yes. Study reveals that both inductive and deductive teaching methods have statistically positively significant effect on undergraduate students’ learning of English grammar – tenses but inductive teaching method is more effective than deductive teaching method for learning English grammar – tenses.

Research Question 2

Are inductive and deductive teaching methods effective for undergraduate students’ learning of English grammar – Use of modal verbs?

H₀₂: There is no effect of inductive and deductive teaching on undergraduate students’ learning of English grammar – Use of modal verbs.

Table 3

Paired Samples t-test Mean Score Comparison of Group A and B on Learning English Grammar – Modal Verbs

Group	Modal Verbs	Mean	SD	t	df	Sig(2.tailed)
A	Pre-test	9.63	1.192	22.895	39	.000
	Post-test	14.68	1.228			
B	Pre-test	9.45	1.260	12.565	39	.000
	Post-test	12.73	.960			

Note: n = 40, p = 0.05

Table 3 is about the statistical values on group A and group B learning English grammar – modal verbs through inductive and deductive teaching. Group A showed improved scores in post test results as (Mean=14.68, SD=1.228) than pre-test results as (Mean=9.63, SD=1.192) conditioned $t(39)=22.895$, $p=.000$. Group B statistics in the table 3 show that post test scores are better than pretest as (Mean=12.73, SD=.960) than pre-test as (Mean=9.45, SD=1.260) conditioned $t(39)12.565$, $p=.000$ but its improvement comparatively is less than group A. It shows that group A performed better than group B in posttest. It yields that inductive teaching is more effective than deductive teaching for teaching English grammar – modal verbs.

Table 4

Independent Samples t-test Mean Score Comparison of Group A and B on Learning English Grammar – Modal Verbs

Test	Groups	Mean	SD	t	df	Sig(2.tailed)
Pre-test	A	9.63	1.192	.638	78	.525
	B	9.45	1.260			
Post-test	A	14.68	1.228	7.912	78	.000
	B	12.73	.960			

Note: n = 40, p = 0.05

Table 4 is about the statistical values gained from independent samples t test outputs. It is actually the comparison of both A and B independent groups on the basis of pre and posttest basis. Pretest result shows that both groups are equal in performance as (Mean=9.63, SD=1.192) and (Mean=9.45, SD=1.260) conditioned $t(78).638$, $p=.525$. Whereas posttest comparison shows statistically significant

difference between the mean scores of both groups A and B as (Mean=14.68, SD=1.228) and (Mean=12.73, SD=.960) conditioned $t(78)7.912, p=.000$. It reflects that group A which was taught with the help of inductive teaching showed better performance than group B that was taught with the help of deductive teaching. It is concluded that inductive teaching is more effective than deductive teaching for teaching English grammar – modal verbs. So, statistical results failed to support the null hypothesis “There is no effect of inductive and deductive teaching on undergraduate students’ learning of English grammar – modal verbs.” and an alternate hypothesis is stated as “There is effect of inductive and deductive teaching on undergraduate students’ learning of English grammar – modal verbs.”. And the research question “Are inductive and deductive teaching methods effective for undergraduate students’ learning of English grammar – modal verbs?” is yes. Study reveals that there is statistically positively significant effect of inductive and deductive teaching methods on undergraduate students’ learning of English grammar – modal verbs. Statistical values yield that inductive teaching method is more effective for teaching English grammar at undergraduate level than deductive method.

Discussion

The study aimed to investigate the impact of inductive and deductive teaching on the learning of English grammar, specifically focusing on tenses and modal verbs among undergraduate students in Pakistan. Data revealed the following findings:

- Inductive teaching proves to be more effective for instructing English grammar, particularly regarding tenses, at the undergraduate level compared to deductive teaching. Student centered teaching is more effective for teaching English grammar where English is being taught as a second language. Students feel more at ease when discussing and contemplating the learning of grammatical rules and principles. This approach aids students in retaining and applying this knowledge in their everyday lives.
- When it comes to teaching English grammar, particularly modal verbs, at the undergraduate level, inductive teaching again proves to be more effective than deductive teaching. Modal verbs have an important function in listening, speaking, reading, and writing. At the same time, these are

mostly used structures in daily conversations – private or official. Therefore, inductive teaching should be adopted by the teachers teaching English grammar – modal verbs.

Inductive teaching is more effective to teach English grammar – tenses where English is being taught as a second language. Second language teaching needs adoption of special methodology and techniques to learn the effective use of that language. Inductive teaching is supported as an effective methodology for students who are learning English as second language. This finding is consistent with Munir et al. (2023), Qizi (2021) who state that inductive teaching is more effective for teaching English grammar – tenses where English is being taught as second language. The same study has recommended deductive teaching method effective for the students who learn English as their first language. Inductive method is supported as student centered. Students play an active role and derive rules from the contextual examples (Rakhmatova, & Kh, 2023).

Similarly, inductive teaching is more effective for teaching English grammar – modal verbs at undergraduate level. It is effective for the students who are learning English as a second language. This finding is consistent with the studies of Martin and Sippel (2023) and Noveria (2021) which state that inductive teaching is preferred for teaching English grammar – modal verbs over deductive teaching. Inductive teaching, being student-centered, not only supports students in retaining grammar rules but also their practical applications over an extended period. The findings from Chen and Xia (2023), Ismail et al. (2023), Latifjono'g'li (2022) studies are also aligned with the findings of present study for teaching grammar effectively through inductive teaching.

Utilizing the inductive method to teach English grammar makes the learning process more engaging and appealing. Inductive method for teaching English grammar is also considered modern because it involves students in the teaching and learning process (Jasmina & Farmonovna, 2023). Habibi (2021) and Hussain and Mehdi (2023) have suggested inductive method for teaching English grammar because it helps teachers to teach English grammar effectively and students to learn English grammar rules easily.

Noveria (2021) has suggested teaching English grammar through inductive method where English is being taught as a second language. Similar recommendations

have been stated in Rauf and Khan (2022) for teaching English grammar with the help of inductive method. Rismayanti (2021) supported inductive teaching and discouraged deductive method for teaching English grammar because the latter is teacher centered method where the teacher is active. The teacher teaches rules and regulations first and students are asked to formulate further sentences as per the rules. Inductive teaching allows students to participate in the class and devise rules from the given examples which belong to their daily life. Therefore, Kim and Won (2020), Habibi (2021), and Latifjono'g'li (2022) have supported the idea of teaching English grammar through inductive method.

Memorizing grammar rules is challenging for students learning English as a second language (Ismail et al., 2023). If rules are attached/linked with examples, then it becomes easy to remember and apply (Kim & Won, 2020). Learning English grammar would become easier when students are involved in teaching learning process (Martin & Sippel, 2023). The inductive method, which engages students in deducing rules from provided examples, plays a crucial role (Blašković, 2022). Studies conducted by Munir et al. (2023) and Obeidat and Alomari (2020) have concluded that the deductive method did not yield as effective results in teaching English grammar compared to the inductive method. Rakhmatova and Kh (2023) and Qizi (2021) have similarly supported the effectiveness of the inductive method in teaching English grammar.

Conclusion and Recommendation

It is concluded that inductive teaching is more effective for teaching English grammar – tenses at undergraduate level in Pakistan where English is taught as a second language. It is further concluded that inductive teaching is more effective for teaching English grammar – modal verbs at undergraduate level. Students who were taught English grammar, specifically tenses and modal verbs, using the inductive teaching method exhibited superior performance in their post-test scores compared to those who were taught through deductive teaching. Therefore, the study concludes that, at the undergraduate level, inductive teaching is more effective than deductive teaching for the instruction of English grammar, encompassing tenses and modal verbs.

Following are the recommendations of the study:

1. Educators teaching English at the undergraduate level are encouraged to employ inductive teaching when instructing English grammar – tenses for improved and more accessible instruction.
2. Similarly, teachers are advised to use the inductive teaching method when teaching English grammar – modal verbs at the undergraduate level.
3. Undergraduate students are encouraged to embrace the inductive method of instruction when learning English grammar, particularly tenses.

Undergraduate students should also opt for the inductive method of instruction when learning English grammar, especially modal verbs.

Future researchers are recommended to:

1. Future researchers are advised to replicate this study at the elementary and secondary school levels.
2. Additionally, future research should encompass other aspects of English grammar, such as parts of speech, sentence formation, cohesion, and coherence, to evaluate the efficacy of both inductive and deductive teaching methods.
3. To enable gender-based comparisons, future studies may consider selecting female undergraduate students as participants.
4. For more generalizable results, future studies could choose participants with language backgrounds other than Urdu.
5. Future researchers may wish to experiment with a hybrid classroom setting when utilizing both inductive and deductive methods to teach grammar, potentially resulting in more effective instruction.
6. Future researchers could develop multiple-choice question (MCQs) tests to evaluate participants' comprehension of English grammar.
7. For a more comprehensive assessment of students' application of English grammar within context, future researchers might design supply-type, essay-type, or expository writing tests.

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