

COMMUNICATIVE COMPETENCIES AMONG BIOLOGY TEACHERS AND THEIR RELATIONSHIP TO CLASS INTERACTION

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Abstract

The aim of the research is to:

- 1- Build a scale that measures the levels of communication competencies among biology teachers.
- 2- Build a scale that measures the classroom interaction skills among biology teachers.
- 3- Identify the extent to which biology teachers possess levels of communication competencies, and the differences in the levels of these competencies according to the gender variable (males – females) .
- 4- Identify the extent to which biology teachers possess classroom interaction skills, and the differences in those skills according to the gender variable (males – females).
- 5- Identify the relationship between the levels of communication competencies and classroom interaction skills among biology teachers.

The research community was determined by biology teachers in middle schools affiliated with the General Directorate of Education in Baghdad - Karkh I for the academic year (2023-2024). The research sample was randomly selected, with a size of (100) teachers. Two tools were prepared, the first of which was a scale of communication competencies that included three dimensions: (confidence in being able to communicate - flexibility in dealing with others - perseverance towards communication) with (20) paragraphs. The second tool was a scale of classroom interaction among biology teachers for the middle stage, which included the skills (classroom management - stimulating motivation and diversifying stimuli - communication and human relations - evaluation) with (20) paragraphs. Their validity and reliability were verified. The researcher applied the two scales in the academic year (2023-2024) AD, the second semester, in middle schools affiliated with the General Directorate of Education in Baghdad - Karkh I. Statistical analyses of the data were conducted and processed using Microsoft Excel and the portfolio. Statistics for Social Sciences SPSS The results showed:

- 1- Building a scale that measures the levels of communication competencies among biology teachers.
- 2- Building a scale that measures the classroom interaction skills among biology teachers.
- 3- Preparatory biology teachers have a good level of communication competencies.
- 4- Preparatory biology teachers have a good level of classroom interaction skills.

5- There is a direct correlation between the levels of communication competencies and classroom interaction skills.

Based on the results reached, the researcher recommended a number of recommendations.

Keywords: Communicative competencies, biology teachers, classroom interaction.

Introduction

Search Problem

Our world today is witnessing numerous changes and challenges, not least the accelerated knowledge and information revolution, which directly impacts society and poses broad challenges in all areas of life. These challenges and changes will surely impact educational systems. Education cannot remain isolated from the changes and challenges facing our world today. This demands that the educational objectives of curricula be aligned with these changes and challenges that have led to global developments, and that efforts be made to prepare individuals to cope with these rapid and successive developments. Experts and specialists seek to develop individual thinking, awareness, and skills to adapt and harmonize with these rapid changes and challenges and to keep pace with the developments taking place. This is achieved through education, which is the tool that deals with the development and training of the individual, as it concerns both the teacher and the student. One of the objectives of modern education is to properly prepare teachers due to their fundamental role in the teaching-learning process. He is the one in charge of achieving the desired goals and is one of the factors for the success of the educational process.. and the success of the educational position in the classroom depends on the degree of interaction between the teacher and the student, Modern educational vision tends to focus on the relationship between them by providing a supportive environment physically, socially and efficiently and this will create an educational climate that senses the student's motivation towards learning, Interacting with his teacher, as such interaction and educational attitudes will be crucial in achieving the desired goals, Thus, a teacher cannot succeed in his or her duties if he or she lacks the qualifications and qualifying abilities that help him or her perform his or her functions in the best way. By practising the teaching profession for many years, the researcher has reached more than (10) Year, in conjunction with fellow teachers and teachers, as well as some previous studies and research on communicative and classroom interaction, she has the idea of this research in studying the level of communicative competencies and classroom interaction of biology teachers and teachers and finding a relationship between them.

The problem of current research can be summarized as follows:

What is the relationship between communicative competency levels and classroom interaction skills of middle school biology teachers and teachers?

Importance of research:

The importance of current research can be summarized as follows:

- 1- Current research focuses on the importance of communicative competencies as the way to understand students' needs and cope with their daily and emergency life situations.
- 2- Communication skills are important to the teacher as the most effective form of understanding, participation and exchange of ideas, experiences and information with students and teachers themselves and to create trust and common understanding, especially in their positive content.
- 3- Develop the relationship between the teacher and his students, making the classroom more interactive for education and achieving goals.
- 4- This research may provide a new vision on regulating the relationship between a teacher and his or her student by providing possibilities for classroom interaction.
- 5- This research is consistent with the interests of Iraq's Ministry of Education and educators in the development and modernization of the educational process.

Research Objectives:

The research aims to:

- 1- Developing a scale to measure the level of communication competencies among biology teachers
- 2- Developing a scale to measure classroom interaction skills among biology teachers
- 3- Identifying the extent to which biology teachers possess different levels of communication competencies, and examining the differences in these competencies according to the gender variable (male – female).
- 4- Identifying the extent to which biology teachers possess classroom interaction skills, and examining the differences in these skills according to the gender variable (male – female).
- 5- Identifying the relationship between the levels of communication competencies and classroom interaction skills among biology teachers.

Search limits: Search limits are limited to:

Human Limit: Biology teachers (male and female) for the preparatory stage in the General Directorate of Education in Baghdad – Al-Karkh First

Spatial Limit: Preparatory and secondary schools affiliated with the General Directorate of Education in Baghdad – Al-Karkh First.

Time Limit: The second semester of the academic year (2023–2024).

Cognitive threshold: communicative competencies and classroom interaction skills.

Definition of terminology

First: Competency Continuous

"The set of judgments recognizing an individual's beliefs regarding his ability and flexibility to communicate with others to confront complex and familiar attitudes as well as his communication perseverance through the use of certain verbal and non-verbal behaviours as well as his belief that experiences and information can be transmitted and exchanged between him and others through listening, speaking, reading, writing and using physical gestures in a timely manner." (Al khozaei, 2017:193)

Procedurally, the researcher defines it as: the ability of middle school biology teachers and teachers to respond correctly to the paragraphs of the Communication Competency Level Scale prepared for the current research of dimensions (confidence in communicability - flexibility in dealing with others - perseverance towards communication), measured by the degree of the respondent (teachers - teachers) on the scale of communicative waste levels.

Second: Class Interaction

"A set of skills and behaviours that the teacher possesses by communicating verbally and non-verbally between both sides of the teaching process in the classroom through educational attitudes while balancing the satisfaction of learners' needs and achieving desired educational goals. (Suleiman, 2015:33)

The researcher identifies her procedurally as: the ability of prep biology teachers and teachers to respond correctly to the classroom interaction skills scale paragraphs prepared for current research, and to have skills (class management, motivation and diversification of thrills - communication, human relations, evaluation), measured by the degree to which the respondent (teachers, teachers) receives on the scale of pure interaction skills.

Second Chapter: Background to theory and previous studies

First axis: Theoretical background

First: Competency Continuous

Communication sufficiency is a contemporary topic of importance in all fields of knowledge. Communication today has become a knowledge and information engine for humans. Communication is indispensable. Since man by his innate nature wishes to communicate with others, His grandfather disagrees with others in views, expressing his feelings and thoughts in people's communication attitudes. communication competence gives an individual an opportunity to express oneself, a non-static, moving concept that depends on an individual's ability to share information with other individuals. Or more is a relationship between two or more, This indicates the individual's realization of having a range of capabilities that allow him to develop communication relations with others, to succeed in such a relationship and to be more broadly and comprehensively communicative than linguistic competence; Because it is efficient to communicate with one's linguistic abilities, especially, and in most cases enough communication is done in a language. Pandora (1977) gave Bandura central importance and the purpose of existing self-knowledge containing subjective expectations about a person's ability to successfully overcome

different attitudes and tasks through self-sufficiency. And it's the idea of those capabilities that he has, so the individual works hard on those tasks that he thinks he finds in. (Khalid and Tah, 213:2012).

Communication sufficiency is one of the concepts presented by Bandura in a context where the role of social and cognitive factors in learning has been highlighted and that the interaction between these factors represents the concept of self-sufficiency, The idea here is that social excitement we receive from the environment in which we live and affects our sense of self-sufficiency when we carry out tasks that require certain skills from us (Alotoum, 12:2005).

The concept of self-sufficiency refers to an individual's ideas of his or her ability to perform in different situations And not identical to the idea of the individual knowing what he wants to do, the belief in these thoughts of the individual with his abilities and skills to translate them into actions and performance guarantees self-sufficiency in meaning what the individual can do in different situations s expectations demonstrate what the individual is expected to do or what specific capabilities he or she needs to perform a task, Part of self-sufficiency depends on a person's self-awareness or self-image. The bulk of it depends on the degree of adequacy of an individual's abilities, and the term adequacy is not synonymous with ability (Qatami, 146:2004).

Social Cognitive Theory

The Bandura theory emerged in the early 1960s, and its main idea is that individuals can learn by observing the actions and consequences of others, emphasizing the role of modelling, as well as alternative reinforcement, and in (1977) Bandura showed changes that included Andorra's learning to take greater care of cognitive factors, such as expectations and beliefs as well as the effects of social models. The modern perspective was called the social cognitive theory Woofdlk, 1998:725)

Self-Efficacy is a theoretical formation developed by the American scientist Bandura (1977) by writing the theory of social learning (Leaming Theory Social). In many years, Albert Bandura tried to lay the philosophical foundations as well as the theoretical concept of self-sufficiency. (Helliregel,2001: 102)

The idea of possible observational learning rather than direct reinforcement, and the distinctive aspect of Pandora's theory (Bandura) that behavioral patterns of individuals form via models to which they are exposed and is understood to be influenced by intermediate cognitive processes, which are perceptions and beliefs held by the individual, So the act of enhancement is not automated, it understands the act of enhancement, where it is influenced by intermediate cognitive processes before it changes and influences the behaviour of building this theory on individuals' beliefs in promoting specific behavior. and is more important in whether they have previously been given the reinforcement of this behavior, If individuals realize that future behaviour has not been strengthened, they will not participate in it. Therefore, conduct is largely structured and based on the expected results in the light of our observation or observation of what others are doing. s beliefs are determined by their past experience (Abu Saad, 142:2010).

Bandura asserts that an individual's self-realization is a fundamental determinant of behaviour in various everyday situations, and communication competence is a set of judgements that reflect one's beliefs in their ability and flexibility to communicate with others in order to confront familiar and complex situations. Besides this communication perseverance using verbal and non-verbal behaviors thus constitutes communication adequacy in three dimensions of behavior as follows:

1- Trust in being able to communicate

That individuals have the capacity to succeed, as this increases their likelihood of making a greater effort to achieve achievement than if they are subjectively suspicious of their abilities; Or focus on personal vulnerabilities when problems arise encouragement and support from others for individuals with sufficient means leads them to try hard enough to succeed, This in turn increases the strength of individuals' beliefs about their adequacy And success is more present with individuals who already have confidence in their abilities, Pandora notes that it is difficult to rely on this method individually should be linked to achievement, it is difficult to convince others of their adequacy under low achievement But the importance of this method can be observed in the negative impact of convincing individuals that they do not have the capacity, They tend to avoid engaging in challenging activities. and by reducing activity and objectives to easy goals, surrender or leave activity easily.

Encouragement and support from others in the learning environment (teachers, colleagues or peers, parents) can verbally convince a student of his or her ability to succeed in special assignments. Persuasion may be internal, taking positive talk with oneself. An individual may remember words told to him or her from childhood and have a profound impact on his or her sense of confidence during the course of his or her life. (Bandura, 1995 : 125)

2- Flexibility in dealing with others

Anticipate and recognize the best way to confront difficult and complex situations by having the flexibility to think and conform to the changes faced by the individual and adapt to each new one. The process of individuals choosing the methods to accept them depends on the individual's subjective beliefs in his or her ability to succeed in a specific activity and perform appropriately (Bandura, 1997:33).

The researcher points out that flexibility in communication may be due to the student's ability to think about alternatives and accept the views of others as well as fluency in talking and the compatibility with different attitudes, thus making it clear that some students have difficulty in moving between different perspectives and that flexibility in communication makes a university student able to change his thoughts in the light of the new information he receives from others. Students with communicative competence are not expected to answer specifically in their minds. They are expecting multiple close answers that revolve around what is needed, and require flexibility and ability to simplify the question or answer when needed.

3- Perseverance towards communication

The degree of communicative sufficiency determines the severity of endeavours and perseverance to overcome obstacles in performing complex tasks. An individual who feels high enough will have more determination, effort and perseverance than an individual who feels less. High pre-assessment of adequacy will give the individual confidence in his or her endeavours. It leads it to success regardless of difficulty and increases people's confidence in meeting the challenges and insistence on making the effort to succeed. This is due to Bandura's statement of strong will, with individuals providing the greatest physical and cognitive energy and effectiveness to ensure continuous success. The realization of adequacy affects the degree of perseverance in meeting their challenges and difficulties (Abdulaziz, 162:2010).

Second: Class Interaction

Interaction is a natural human process. In classroom interaction, students gather in a climate of free dialogue and reflection, in which students find their humanity and express their vitality and ability to organize good attitudes and relationships (Qatami et al., 2008:108). (Mohammed, 2007) indicates that learners share their life experiences through several means, including: Play, group work and public discussions. This knowledge exchange is very useful for students because it enriches their knowledge structure, especially during classroom interaction (Mohammed, 2007:181); Because in-class learning is not only a psychological subjective process through which knowledge is built, it is also a set of social processes that affect students' learning opportunities, practice and participation in daily events within the classroom and school (Nader and Wa 'el, 2006:2).

Importance of classroom interaction:

The subject of classroom interaction in the educational process is considered by many educators as one of the most important subjects to be addressed by both the educational mentor, the teacher and the pupil for the following reasons:

- 1- Relies on classroom interaction in the planning of education and learning and in the implementation and evaluation of what has been planned.
- 2- Classroom interaction is important in a teacher's work. Having been a teleprompter with the task of education, he became a mentor, organizer and mentor. The student became a participant only after he was a recipient.
- 3- In the process of classroom interaction, students develop their thoughts and opinions and raise their level of knowledge.
- 4- Increases students' vitality in the educational situation, freeing them from silence and negativity to research, discussion and exchange of views on issues that concern them and meet their needs.
- 5- It helps students develop positive attitudes towards others and their attitudes, and their opinions are listened to and respected by others.

6- Classroom interaction offers opportunities for students to express their knowledge building and the concepts they possess by giving their opinions and presenting ideas on any topic or class issue.

7- Students provide opportunities for transition training and gradually get rid of their self-centred thinking towards cooperative collective action.

8- It offers opportunities suited to students' abilities and mental potential to practice independent thinking under conditions close to normal and vital as they have adequate opportunities as in real life. (Al filfeli, 2013:152)

1- Types of lateral interaction:

A- Verbal interaction : The observation of events within classrooms in various schools can see the predominance of verbal interaction over other classroom activities, as talk is a major means of communication between learners on the one hand and between them and their teachers on the other, as it is considered a practical practice that perpetuates the concept of feedback and represents a quantitative assessment of the dimensions of behaviour (for teachers and learners) While closely related to the social and emotional climate of educational attitude, this climate inevitably affects one way or another in learning outcomes, in terms of teachers' trends towards learners and learners' trends towards their teachers.

B- Non-verbal interaction: This type represents every non-verbal expression, such as certain gestures, suggestions, eye movements, moving head, moving hand, moving fingers... They are only intentional signals of surprise, anticipation, interest... and at the same time they represent spontaneous indications of the learner's positive, negative or neutral direction within the classroom. (Abdul Latif and Al-Khatibah, 2004:153)

2- Underlying pillars of verbal interaction skills:

Verbal classroom interaction is based on several pillars, including:

A- Mental processes: Classroom interaction is more focused on the practice of rapid mental processes that require the learner to understand the ideas offered to him or her as well as represent them, absorb them and engage his or her mind in advanced and sophisticated mental processes by using content with a specific answer on a question or discussion with a colleague in his or her opinion.

B- Practising subjective thoughts: Classroom interaction gives learners the opportunity to practice their subjective thoughts and makes them more vibrant and effective while increasing their exercise of mental activities.

C- Concepts: Classroom interaction is often with learners' concepts, which include what their knowledge stock contains and what they employ in their activities related to various processes, so the larger their knowledge buildings, the higher their level of need and discussion, and a higher level of knowledge in diverse processes.

D- Evolutionary developmental stage: Most of those interested remind that a learner's classroom interaction is determined by the intellectual processes that he or she can exhibit in addition to his or her stage evolutionary developmental experiences. Therefore, a teacher

is a pedagogical mediator or instructor who employs his or her experiences effectively with knowledge structures and age-specific intellectual processes.

E- Level of cognition: Classroom interaction can be determined by the level of cognitive representations of learners in which they absorb the objects, materials or experiences around them. The higher the level of representation of the learner and his/her perception of the elements and experiences, the higher the opportunities for interaction and the higher the level of his/her mental processes that he/she can use in his/her classroom educational attitudes and experiences.

F- Independent thinking: Independent thinking processes are one of the focuses of classroom interaction, especially when it is concerned with the processes of acceptance of feeling, the process of asking questions, the learners' initiative and acceptance of the ideas of their colleagues. (Qatami et al., 2000: 824-825)

3- Classroom interaction patterns:

A- One-way pattern: The one in which the relationship is communicative, in which the teacher is the primary actor, usually linear, in which the relationship is taught according to a set of values, obedience and compliance.

B- The two-way pattern: The one in which the relationship is communicative so that the content of the study is the essential and active element and occupies the centre of the educational act And the relationship here is also linear, but it differs from the one-way pattern of being bi-directional, This type of communication prevails when the school is functionally attending. in the context of change and social progress and contributing to development.

C- Multi-directional pattern: This is a pattern in which the communication relationship is saturated with the content of self-values, freedom and autonomy, and this kind is scarce and rare in the world despite the vast majority's claim to represent it education ", a formula in which the learner is the centre of the educational process, and the relationship here is also binary as it prevails in the school that relies on the learner as the centre of the learning process as an individual or group, as its programmes, means and evaluation system respect the learner's individual specificity and act on his or her independence from all pressures, whether school, social, political or ideological. (Alfifeli, 2013:153)

Classroom interaction skills

The skill of drafting class questions: questions are an important factor that enables the skills of formulating questions and methods of directing them

Motivational excitement skill: which means creating a desire and motivation for learning in students, through motivation and linking class attitudes to aspects of personal interest in students

The skill of diversifying thrills: diversifying thrills stimulates students to work and encourages them to innovate, the more the class environment is filled with thrills that are more motivational

Communication and Human Handling Skills: This skill requires the teacher to take into account human aspects and to take care of students' feelings and personal problems and to work towards their resolution. However different definitions of classroom interaction are, however, shared in their description of the communication relationships between the teacher and the students on the one hand and the students themselves on the other, a natural consequence of the human presence in a certain setting. (Abdelhadi, 2004:182)

Second Axis: Previous studies

1- Studies on communicative skills

Al-Tai (2017): The study aimed to determine the level of communication adequacy and its relationship to the cognitive style of university students, and to achieve that goal the communication adequacy scale was built based on Pandora's 1988 theory of three areas (Trust in communication - flexibility in dealing with others - and perseverance towards communication) 40 paragraphs. The scale of Abdul's cognitive style was adopted, 2014 based on the 1988 Reading theory of 40 paragraphs. The Cychometric characteristics of the two measurements were ascertained. (400) A student and a student of Qadisiyah University for the academic year 2016- 2017 the research has found that university students have good communicative competencies and tend to use a more verbal-dimension cognitive method than a perceived dimension, and there is a positive correlation between them. (Altaei, 2017: Summary)

2- Studies on the classroom interaction variable

Attallah (2022): The study aimed at the classroom interaction skills of primary school mathematics teachers and their relationship to their pupils' achievement, and the sample of the study consisted of 28 Teachers in Baghdad's education schools selected in a deliberate manner, as well as selected (10) Students randomly requested by each teacher and thus the sample of students consisted of (280) Students and to achieve this, a note card consisting of (55) A five-pronged paragraph as well as a collection test from (18) A paragraph of multiple choice type, the connotations of honesty and consistency were ascertained for the study. (Attallah, 2022:465)

Third Chapter: Research methodology and procedures

I. Research curriculum

The researcher chose the descriptive research method because it is the most suitable for the purposes of the current study.

Second: Research Society:

The current research community is represented by biology teachers for the preparatory stage in the preparatory and secondary schools of the General Directorate of Baghdad Education - First Karakh for the academic year 2023-2024.

Third: Sample Research:

Three samples were selected: a sample clarity of the scale instructions of 25 teachers, a sample of 200 teachers for statistical analysis, and a basic research sample of 100 teachers.

Fourth: Research tools

A- Communicative Efficiency Scale:

Steps to build it went according to the following:

1- Defining the Objective of the Scale: The objective of the scale was to measure the levels of communication competencies among biology teachers at the preparatory stage.

2-Formulating the Scale Items :To develop the scale items, the researcher reviewed a number of studies, research papers, and scales related to communication competencies, in addition to Bandura's Social Cognitive Theory. Based on this, the researcher was able to formulate 20 initial items that measure the levels of communication competencies among male and female biology teachers at the preparatory stage, according to three dimensions.

3- Scale Instructions: The instructions included how to respond to the scale items and how to score those responses. The scale requires answers using the options: Always, Often, Sometimes, Rarely.

4- Pilot Application of the Scale: The pilot application was conducted as follows:

First Pilot Application: The researcher administered the scale to a sample of 25 teachers on Sunday, February 18, 2024, to ensure the clarity of the scale's instructions and items, as well as to determine the time required to complete it, which was 30 minutes.

Second Pilot Application: The scale was administered to a randomly selected sample of 200 biology instructors from secondary and high schools during the period from Tuesday to Monday, February 20–26, 2024. This was done for the purpose of conducting statistical analyses and calculating the psychometric properties of the scale items.

5- Validity: The researcher presented the scale to a group of experts and specialists in the fields of psychology, life sciences teaching methods, and measurement and evaluation. The total number of experts was 15. This was done to assess the scale's validity and determine whether any items needed to be deleted, added, or modified. After collecting and analyzing the data, it was found that all calculated Chi-square (χ^2) values, which reached (4.6), were greater than the tabulated value of (3.7) at 1 degree of freedom and a significance level of (0.05).

6- Reliability: Reliability was determined using Cronbach's Alpha formula, and the reliability coefficient for the communicative competencies scale was found to be 0.82, which indicates that it is a good and acceptable value.

7- Final Version of the Communicative Competencies Scale: The final version of the scale consisted of three dimensions with a total of 20 items after modifications were made. Thus, the first objective of the current research was achieved.

B: Classroom Reaction Scale:

Its construction followed the following steps:

1- Benchmarking: Measuring classroom interaction skills of middle school biology teachers and teachers.

2- Drafting of Classroom Reaction Scale paragraphs: The researcher was briefed on a number of studies, research and related metrics, and was able to formulate (20) a paragraph measuring classroom interaction skills of preparatory biology teachers.

3- Measurement instructions: Include answer instructions and answer correction instructions, since the scale requires answering (always, often, rarely), where the paragraphs are formulated in a positive direction, with grades (4,3,2,2, 1) and reverse (1,2,3, 4).

4- Exploratory application of the scale: By conducting two reconnaissance applications, the agencies:

The first exploratory application: It was applied to a sample of (20) male and female teachers on Monday, (19/2/2024), to ensure the clarity of the instructions and the clarity of the items, as well as to determine the response time, which was (30) minutes.

The second exploratory application: It was applied to a random sample of (200) male and female biology teachers in secondary schools during the days (Tuesday–Sunday), corresponding to (27/2–3/3/2024), for the purpose of conducting statistical analysis and calculating the psychometric properties of the scale items.

5- Honesty: extracted by presenting the scale to a number of experts and specialists in the field of psychology and methods of life sciences teaching, measurement and evaluation. (15) For the purpose of identifying its validity and making appropriate adjustments, deletions or additions, after statistical analysis, it has been found that all values Calculated at (4.5) greater than the tabular value of (c2) (3.84) and an indicative level (0.05), thus all paragraphs of the scale are acceptable with some modifications.

6- Persistence: It was extracted using the FCF-Cronbach coefficient as the coefficient of FCM (0.79) indicates that it is a good and acceptable coefficient.

7- Final version of the metric: The metric is finalized from (20), after adjustments have been made, thereby achieving the second objective of the current research.

Fifth: Application of research tools

The researcher applied the research instruments, represented by the Communicative Competence Scale and the Classroom Interaction Scale, after reaching their final forms, to the current research sample consisting of (100) male and female biology teachers at the secondary stage during the second semester of the academic year (2023–2024), for the period from (4–7/3/2024).

Sixth: Statistical means

The researchers used some appropriate statistical tools for the Social Science Statistical Pouch (SPSS-10) and Microsoft-Excel for data processing.

Fourth Chapter: Presentation and discussion of results

First: Presentation and discussion of results

1-The first objective: To construct a scale that measures the level of communicative competencies among male and female biology teachers at the .

2- **The second objective:** To construct a scale that measures classroom interaction skills among male and female biology teachers at the secondary stage. This was detailed in Chapter Three.

3- **The third objective:** To identify the extent to which male and female biology teachers at the secondary stage possess communicative competencies, and the differences in their levels of communicative competencies according to the gender variable (males – females).

To achieve this objective, the researcher calculated the mean and standard deviation of the responses of the biology teachers at the secondary stage who represent the current research sample, which consisted of (100) male and female teachers. After applying the one-sample t-test to determine the significance of the differences between the arithmetic mean and the hypothetical mean, it was found that the difference was statistically significant in the Communicative Competence Scale in favor of the arithmetic mean, as shown in Table (1).

Table (1) T-test results for the significance of the difference between the arithmetic mean and the hypothetical mean in the Communicative Competence Scale

Significance 0.05	T value		Free degree	Medium Hypothetical	Standard deviation	Arithmetic average	Sample	Variable
	Tabular	Calculated						
Function	1,96	23,40	100	17,5	5,631	30.68	100	Communicating skills

Table (1) shows D difference statistically, as the calculated T value (23.40) When balanced with the tabular (1,96), the average research sample appeared to be higher than the hypothetical average. This shows that they have a good level of communication competencies. This is due to the fact that biology teachers and teachers have adequate preparation and training in addition to the field of experience in dealing with students and experience in daily life through which good communication methods can be used.

For the purpose of ascertaining differences in communicative competencies among teachers of prep biology according to the sex variable (male-female), the researcher used the T-test for two separate samples, as in table (2).

Table (2) t-test results for two independent samples to test the indication of differences between Averages of teachers' and biology teachers' grades in the measurement of communicative competencies according to the sex variable

Significance level at 0.05	T value		Standard deviation	Arithmetic average	Sample size	Variation source	Variable
	Tabular	Calculated					
Function	1.96	6.068	1.80	14.40	50	Male	Communicating skills
			2.51	11.29	50	Female	

Table (2) shows that male biology teachers possess higher communicative competencies than their female counterparts. This may be attributed to the higher participation rates of male teachers in training courses, seminars, and workshops organized by educational institutions and bodies affiliated with the Ministry of Education to develop communicative skills. In contrast, female teachers often face more responsibilities and daily life engagements, which may lead them to take more regular leaves and maternity leaves, reducing their participation in such developmental activities.

4- Objective Four: To identify the level of classroom interaction among male and female biology teachers at the secondary stage, and to examine the differences in classroom interaction according to the gender variable (male - female).

The researcher calculated the mean and standard deviation of the scores of the research sample, which consisted of 100 teachers. After applying the one-sample t-test to determine the significance of the differences between the actual mean and the hypothetical mean, the results were as shown in Table (3).

Table (3): One-sample t-test results to examine the significance of the difference between the actual mean and the hypothetical mean on the Classroom Interaction Scale

Significance level at 0.05	T value		Medium Hypothetical	Standard deviation	Arithmetic average	Sample	Variable
	Tabular	Calculated					
Function	1.96	4,77	105	3,72	114,68	100	Classroom interaction

Table (3) indicates that male and female biology teachers at the secondary stage possess a good level of classroom interaction skills. This can be attributed to the knowledge and skills they acquire through training courses organized by the General Directorate of Education and researchers, aimed at enhancing teachers' professional performance. Additionally, some teachers hold advanced degrees in biology and teaching methods, which has provided them with extensive knowledge about classroom interaction and its related skills.

The process of good classroom interaction is one of the most important factors for the success of the educational-learning process. It provides and creates a successful classroom environment. Education is a deliberate process that works to arrange and regulate all conditions, which relate to the learner and his/her experiences, aptitudes and motivation, so that the teacher can achieve his/her goals of giving information he/she wishes to the learners in an orderly manner.

To examine the differences between male and female biology teachers at the secondary stage in their level of classroom interaction skills, the researcher used the independent samples t-test. The results are presented in Table (4).

**Table (4) t-test results for two independent samples to test difference indication
Between the averages of teachers' grades and biology teachers in the class interaction
scale according to the sex variable**

Significance level at 0.05	T value		Standard deviation	Arithmetic average	Sample size	Variation source	Variable
	Tabular	Calculated					
Function	1.98	4,84	2,83	112,57	50	Male	Classroom interaction
			3,61	113,83	50	Female	

Table (4) shows that female teachers have more class interaction skills than male teachers. This may be due to the fact that female teachers are more able and more accessible to the educational process. In the classroom, the school considers the classroom interaction more favourably than the teacher, This result can also be explained by psychological composition. Women teachers are sensitive and passionate. They are most responsive to teachers' pressure. More than teachers have a psychological motivation to prove themselves, which has a positive impact on their teaching.

5- Goal 5: The relationship between communicative competencies and classroom interaction of biology teachers and teachers for the preparatory phase is known.

To identify the strength and type of correlation between communicative competencies and classroom interaction, the researcher used the Pearson equation, which was worth (0.567). From Table 5, there is a strong PTP correlation between Prep Biology Teachers' and Teachers' Grades on the Communicative Competencies Scale and their Grades on the Classroom Reaction Scale.

Table (5) Correlation between communicative competencies and classroom interaction

Significance level	Tabular value	Correlation Coefficient	Sample	Variables
Function	0,114	0.567	100	Communicative skills
				Classroom interaction

This may be due to teachers having good classroom interaction skills that enabled them to practice having communicative skills.

Third: Conclusions

In the light of the research results, the researcher concluded the following:

- 1- Having a good level of communicative skills and biology teachers for the preparatory phase.
- 2- Having a good level of classroom interaction skills for prep biology teachers and teachers.
- 3- There is an exclusive correlation between communicative competencies and classroom interaction skills.

Fourth: Recommendations

In the light of the research's findings, the researcher recommended the following:

- 1- The preparation and training departments of the General Directorates of Education in the governorates conduct training courses and workshops to upgrade the level of communicative skills and classroom interaction skills of both teachers and teachers for newly recruited owners.
- 2- Encourage teachers to read and learn about the latest scientific developments that deepen their knowledge and information and help them in successful class management.
- 3- Train all teaching staff in effective communication methods and patterns and develop their communication and classroom skills and interactive capabilities.

Fifth: Suggestions:

The researcher suggested that other studies be carried out, as follows:

- 1- Conducting studies similar to the current research on the student category.
- 2- Conducting studies to measure the communicative competencies and classroom interaction of teachers and teachers from their students' perspectives.

References

1. Abdul Aziz, Miftah Muhammad (2010): Introduction to Health Psychology Concepts - Theories - Models - Studies, Wael Publishing House, Amman.
2. Abdul Hadi, Nabil Ahmed (2004): Contemporary Educational Models, 1st ed., Wael Publishing House, Amman.
3. Abdul Latif, Hussein and Al-Khattaiba, Majida Muhammad (2004): Creative Methods in University Teaching, Dar Al-Shorouk for Publishing and Distribution, Amman - Jordan.
4. Abu Saad, Ahmed Abdul Latif (2010): Personality Psychology, Modern World of Books, Amman.
5. Al-Atoum, Adnan Yousef (2005): Educational Psychology, Dar Al-Masirah for Publishing and Distribution, Amman.
6. Al-Falfi, Hana Hussein (2013): Educational Psychology, Kunuz Al-Ma'rifa House, Amman.
7. Al-Khazai, Ali Saqr (2017): Communicative Competence and Motivational Trends (Internal - External) among University Students, Journal of the Babylon Center for Human Studies, Volume 7/ Issue 1. Pages 187-240
8. Al-Taie, Baidaa Saleh (2017): Communicative Competence and Its Relationship to Cognitive Style among University Students, Unpublished Master's Thesis, Al-Qadisiyah University - College of Education.
9. Atallah, Fadhel Abdul Abbas (2022): Classroom Interaction Skills of Mathematics Teachers in Primary Schools and Their Relationship to Their Students' Achievement, Journal of the Kufa Studies Center, Volume 1, Issue 67, Pages 465-506.
10. Bandura , A. (1995) : Self- Efficacy in Changing, Cambridge University Press, New York.

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11. Bandura, A(1998) : Self- efficacy: The exercise of control , Freeman , New York.
 12. Hellriegel, D. (2001) : Organizational Behavior ,ohio. South.Western college publishing .
 13. Khaled, Mohammed Bani, and Al-Tah, Ziad Khamis (2012): Educational Psychology Principles and Applications, Wael Publishing House, Amman.
 14. Muhammad, Jassim Muhammad (2007): Learning Theories, 1st ed., Dar Al Thaqafa, Amman.
 15. Nader, Wahba, and Wael Kishk (2006): Analysis of Pedagogical Discourse and Interaction Patterns in a Palestinian School, (Internet).
 16. Qatami, Yousef (2004) Social Cognitive Theory and its Applications, Dar Al Fikr, Amman.
 17. Qatami, Yousef and others (2008): Instructional Design, 1st ed., United Arab Company with Al Quds Open University, Cairo.
 18. Qatami, Yousef, Majed Abu Jaber, and Nayfeh Qatami (2000): Instructional Design, Dar Al Fikr for Printing, Publishing and Distribution, Amman - Jordan.
 19. Suleiman, Adi Ahmed (2015): The Degree of Arabic Language Teachers' Practice of Classroom Interaction Skills and Its Relationship to the Improvement of Oral Language Ability among Tenth Grade Students in Jordan, Unpublished Master's Thesis, Al al-Bayt University - Amman.
 20. Woolfolk , A. (1998) : Educational Psychology, Boston. Allyn and Bacon Education, New York .