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The Effect of Teaching in the English Language on the Understanding of Biological Concepts Among the Students of the Second Intermediate Grade in the Distinguished Schools

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Abstract

In view of the importance of the English language in teaching and the specificity of scientific subjects as it is the language of science and communication and the language of modern scientific technologies in the world, and in line with these data, the decision of the Ministry of Education in the Republic of Iraq was to instruct the teaching of scientific subjects (Mathematics, Physics, Chemistry, Biology) in the schools of gifted and distinguished students by the language English and according to the curricula prepared for that. Today, despite the passage of six years since the application of this experiment began, there is no scientific study (as far as the researcher knows) based on this experiment from a scientific point of view in terms of results, except for poor discussions on the margins between supporters and opponents of the teachers in charge of teaching these subjects. The sources of these attitudes are multiplied between a national standpoint to preserve identity or an objective one since language is an essential part of the structure of thinking, and therefore teaching science in a language other than the mother tongue negatively affects the efficiency of understanding and assimilation of various scientific concepts to varying degrees according to the nature of the study material. The researcher, through his teaching of life sciences for intermediate stages, was an eyewitness to the problems that students suffer from during their studies, and from this point of view, it was necessary to try to conduct a scientific evaluation on the results of this experiment in an attempt to overcome ready-made judgments, whether supporters or opponents that are not based on objective data, thus placing the decision maker on a clear awareness in the process of evaluating the experiment.

Keywords: *Teaching English, Biological concepts, Second Intermediate Grade.*

Introduction

Understanding and developing biological concepts among learners is one of the pivotal goals in teaching science, including life sciences, in all educational stages, because the knowledge structure of the learner consists of multiple facts that gather to form concepts linked to rules, principles, and laws by finding relationships between them [1], Hence, any shortcoming in the possibility of forming or absorbing these concepts reflects a deficit in the educational process and its outputs, and a failure to achieve one of its most

[1] Ayesh Zaytoon, "Contemporary Global Trends in Science Curricula and Teaching," *Amman: Dar Al–Masera for Publishing, Distribution and Pringint*, 2010.

important goals. Therefore, it is necessary to stand the extent to which the learners understand the concepts that are taught, and therefore to determine the value of the experiment by comparing the results achieved with the goals set. From this point of view, the importance of this research lies in the fact that it is an attempt to determine the success of using the English language in teaching science, including life sciences, in understanding biological concepts and thus Achieving the goals that have been set.

The findings of this research offer valuable insights for the development of English-taught scientific curricula, particularly in schools catering to academically excellent students. By providing a comprehensive assessment tool, educators can better gauge the understanding of biological concepts among second-grade intermediate students attending distinguished schools. The study also delves into the impact of English instruction on the comprehension of biological concepts among these students.

The overarching research goal is to discern the extent to which second-grade intermediate students in distinguished schools comprehend biological concepts when instructed in English. This investigation addresses whether there is a discernible influence of the gender variable on the understanding of biological concepts among students in this demographic. The research community comprises second-grade intermediate students enrolled in Distinguished Schools under the General Directorate of Nineveh Education. The study is confined to the academic year 2022-2023, focusing on the Biology textbook specifically designed for intermediate students, second grade, in distinguished schools. This textbook, the Fifth Intermediate Edition, is sanctioned by the Ministry of Education, Republic of Iraq.

In formulating the research assumptions, two null hypotheses were posited. First, there is no statistically significant difference, at a 0.05 significance level, between the mean scores of students taught in English and the hypothetical mean in the comprehension test of biological concepts. Second, there is no statistically significant difference, at a 0.05 significance level, between the mean scores of male and female students in the comprehension test of biological concepts taught in English. These assumptions lay the groundwork for investigating the effectiveness of English instruction on students' comprehension of biological concepts and exploring any potential gender-based variations in the outcomes. The study, anchored in these assumptions, aims to contribute meaningful insights to the ongoing discourse on language-based pedagogical approaches in the context of biology education.

Understanding biological concepts: defined Wiggings and Mctighe[2] : as the ability of the student to present the meaning of the material and the educational experience, interpret it and apply it effectively in new situations and different contexts, and the ability to take a perspective and see things from a critical perspective, and the emotional participation with others and the perception of the learner For his mental and personal

[2] Grant P Wiggins and Jay McTighe, *Understanding by Design* (Ascd, 2005).

habits that make up his private consciousness.[3] Distinguished High Schools: They are schools established by the Ministry of Education in Iraq in the beginning of 1991 AD, with two secondary schools, the first for boys and the second for girls in Baghdad, and then they were opened in all provincial centers, and they are especially for students who have met certain academic requirements.

The study was conduct isKocakulah et al., [4]: The study was conducted at the Turkish University of Balkesir, and the experimental method was used for two groups, the control and the experimental, and it aimed to identify the impact of teaching in a foreign language (English) on the conceptual understanding of science for primary school students. The study reached a conclusion is a significant difference in the formation of scientific concepts between students who were taught in a foreign language (English) compared to students who were taught in the mother tongue, in favor of the group that was taught in the mother tongue. In other hand, Mesbaah[5]: The study was conducted at Ajman University of Science and Technology in the United Arab Emirates, and the sample consisted of 417 male and female students who were chosen randomly, for the first semester 2003-2004. English, and reached the following results that students did not agree to study the courses of the educational technology program in English. The students faced difficulties in knowing the meanings of the English vocabulary mentioned in the course.

The study of Kiraz et al. [6]: This survey was conducted at the Near East University in Turkey, and aimed to identify the level of achievement among students in the eighth grade of science and technology in private and public schools that teach in English, and the study reached a conclusion, which is: decrease in the arithmetic mean of the grades of students in science and technology who were taught in English, compared to the specified passing grade. Salim[7] studies was conducted in the Faculty of Education, Damietta University / Arab Republic of Egypt, and the research sample consisted of (60) male and female students from the fourth grade of primary school, with an amount of (30) for each of the experimental and control groups, and it aimed to identify the effect of using some strategies Teaching science in English, and the research found that there is a statistically

[3] A M Al-Shalabi, "Shalahuddin Al-Ayyubi Wa Wujuduhu Fi Qadhafi''ala Al-Daulah Al-Fathimiyah Wa Tahrir Bait Al-Maqdis," *Kairo: Dar Ibnu Jauzi*, 2007.

[4] Sabri Kocakulah, Evrim Ustunluoglu, and Aysel Kocakulah, "The Effect of Teaching in Native and Foreign Language on Students' Conceptual Understanding in Science Courses," in *Asia-Pacific Forum on Science Learning and Teaching*, vol. 6 (The Education University of Hong Kong, Department of Science and …, 2005), 1–30.

[5] A A Mesbaah and N Mutawa'a, "Arabization and the Problem of Using English Language as a Medium of Educational Communication in the Faculty of Sciences, Kuwait University," *Educational Journal* 4 (1988): 15.

[6] Aşkın Kiraz et al., "Effect of Science and Technology Learning with Foreign Langauge on the Attitude and Success of Students," *Procedia-Social and Behavioral Sciences* 2, no. 2 (2010): 4130–36.

[7] Shaima Abdel-Salam Salim, "Using Some Strategies for Teaching Science in English to Develop Scientific Concepts and the Survival of the Impact of Their Learning among Primary School Students in Experimental Language Schools," *Journal of the College of Education, Mansoura University* 22, no. 110 (2020): n1.

significant difference between the mean scores of the students of the experimental group (which used some strategies for teaching science in English) and the scores of the students of the control group (who were taught in the usual way) in the immediate and delayed test of scientific concepts and the acquisition of scientific concepts and survival effect in favor of all the experimental group.

Method

In assessing the impact of English-Medium Instruction on scientific subjects in gifted and distinguished schools over a six-year period in Iraq, a post-experimental semi-experimental design was employed, specifically adopting a one-group design without an equivalent control group. The experimental design was chosen to facilitate a thorough examination of the outcomes of English-Medium Instruction on students in gifted and distinguished schools. The post-experimental aspect of the design allowed for the evaluation of the educational intervention after its implementation, providing insights into the effectiveness of teaching scientific subjects in English. [8]

The decision to opt for a semi-experimental design acknowledges the practical constraints and the complex nature of educational settings. In this context, a control group without an equivalent rate was selected, considering the specific conditions and characteristics of the participating schools. This design allows for a focused analysis of the impact of English-language instruction within the unique context of gifted and distinguished schools, providing a more nuanced understanding of the outcomes.

The absence of an equivalent control group emphasizes the practical challenges inherent in implementing controlled experiments in real-world educational environments. Nonetheless, the one-group design enables the exploration of the intervention's impact over the six-year period, shedding light on trends, patterns, and potential correlations within the studied group of students. Through this methodological approach, the study aims to contribute valuable insights into the long-term effects of English-Medium Instruction on the academic performance and comprehension of scientific subjects among students in gifted and

[8] Amin Ali Muhammad Suleiman and Rajaa Mahmoud Abu Allam, "Measurement and Evaluation in the Human Sciences," *Foundations, Tools and Applications, First Edition, Dar Al-Kitab Al-Hadith, Cairo, Egypt*, 2010.

distinguished schools in Iraq. The six-year perspective allows for a comprehensive analysis of the sustained impact of this instructional approach, providing a basis for informed decision-making in the realm of science education.

Research experimental design

Dependent variable		independent variable	Group
Understanding biological concepts		Teaching in English	experimental group

The experimental group means the group that was exposed to the independent variable, which is teaching life sciences in English, while the dependent variable is the degree of understanding biological concepts, by comparing the degree obtained by the student with the accepted hypothetical mean set by the instructions of the Ministry of Education, which is 75%. The research community means all students to whom the results of the research can be circulated [9]. In this research, they are middle school students for the second intermediate grade in the distinguished schools of the Nineveh Education Directorate for the academic year 2022-2023 AD. It is the part to which the research is applied from the research community, which is chosen according to special controls for each representative of the community correctly [10]. In this research, it was represented by the students of the second intermediate grade of Ghanem Hammoudat School for the Distinguished for the academic year 2022-2023 AD affiliated to the Directorate of Nineveh Education.

The Learner's Own Willingness and Motivation to Learn in General, and to Learn Scientific Concepts in Particular

In the light of what has been presented, the researcher believes that all those interested in teaching and learning science should increase interest in the formation and development of scientific concepts among learners as one of the objectives of science in all stages of education, and because of its great importance in building science and knowledge, organizing experiences and access to them. This is in light of what our world is witnessing today of an unparalleled demand for learning the English language to become a secondary language in addition to the language circulated within the country.

[9] Muhammad Khalil Abbas et al., "Introduction to Research Methods in Education and Psychology," *Dar Al-Maysara for Printing and Publishing, Amman*, 2009.

[10] Azzam Sabri, *Statistics in Education and the Spss System*, *The World of Modern Books, and the International Book Wall for Publishing and Distribution, Amman, Jordan*, vol. 4 (The World of Modern Books, and the International Book Wall for Publishing and Distribution, Amman, Jordan, 2006).

Learning any foreign language contributes to preparing a learner and citizen of the twenty-first century to be bilingual and trilingual, in conjunction with the continuous and scientific development of language teaching curricula and policies [11].

Teaching Language and Level of Proficiency

As long as the teaching language is an educational means of communication between the sender and the recipient, then the educational means of communication must be effective and achieve communication, and in order for the language to be effective, the learner must master it in reading, speaking and writing. And when it is necessary to teach students in a language other than the mother tongue, intensive language programs must be applied in order to master them and absorb the scientific material that they learn[12].

If the language of instruction is the mother tongue of the learner, then it is easier for him or her to absorb what he is presented, and when it is not like that, especially when he is not proficient in it, then it reflects on him with many difficulties. An individual who makes an effort to understand what he reads when reading a book in the mother tongue needs to make a double effort to understand a written book in a foreign language[13]. Also, strengthening the mother tongue is not limited to the intellectual aspect and the national feeling, but extends to other aspects, including as an indicator of the growth of the second language, as well as the growth of students' capabilities[14].

Teaching Language and the Need for it in the Future

Many believe that the language of teaching science should be English, because it is an international language and the student needs it to complete his higher studies. It also provides a job opportunity for many distinguished jobs, and this is what encourages many to introduce their foreign children. Learning foreign languages expands the circle of the individual's culture and knowledge, in addition to that the student who uses two languages are more flexible in thinking as a result of processing information in two different languages. In our contemporary reality, the bilingual and cultural individual is an important source in the contemporary globalization economy[15].

The student is able to understand and assimilate what is presented to him when she is an adult mother with greater efficiency, and then it provides a greater opportunity for creativity in the outputs based on it, and this is reflected by the Microsoft company in making it available for circulation several information systems that took into account the

[11] Changjuan Zhan, "The Importance of Culture Factor in Foreign Language Teaching," *Theory and Practice in Language Studies* 6, no. 3 (2016): 581.
[12] Istvan Kecskes and T Nde Papp, *Foreign Language and Mother Tongue* (Psychology Press, 2000).
[13] Hassan Hamzé, "Terminology and Translation in Arabic," *Handbook of Terminology: Volume 2. Terminology in the Arab World* 2 (2019): 59.
[14] Glenn Fulcher, *Testing Second Language Speaking* (Routledge, 2014).
[15] Fulcher.

specificity of each language, so that it is easy to use most Languages and their Arabic in the fields of innovation and creativity. [16]

The Arabic language is not limited to others in absorbing knowledge and sciences, if the applied practice of it, whether in the field of word or text processing, proves the ability of the language to deal with computers with systems, software, and equipment with the Arabic letter and language, just as the wide range of its fields of use in informatics, storage, documentation, education, training, and communication has been proven. And this is what the world witnessed through the recognition of the United Nations Organization, the World Organization for Education and Science, and other international organizations and agencies that it is a living language and its adoption as an official language along with the other five languages: English, French, Spanish, Russian, and Chinese.

Research Requirements

The scientific subject was represented by the curriculum of life sciences for the second intermediate grade in the distinguished schools / second edition, and it included the following chapters: Chapter (3, 4, 5, 6), which are: (Protists, fungi, algae, plant classification). To determine the main and sub-concepts, the content of the subject was analyzed, where (11) main concepts were extracted, each of which is linked to several sub-concepts, to benefit from them in preparing the behavioral goals that are to be achieved and building the test paragraphs for the understanding of biological concepts, after presenting them to a group of experts and specialists in Life sciences and teaching methods to ensure their validity and coverage of the subject matter of the experiment, and it has been approved after making appropriate modifications according to their opinions.

The behavioral goals were formulated based on the analysis of the educational material included in the experiment, as they amounted to (34) behavioral goals for the cognitive field, the second level, according to Bloom's classification (absorption), distributed over the chapters of the book, and they were presented in their initial form to a group of experts and specialists in the field of life sciences and methods Teaching it, to give their opinions about its suitability and coverage of the content of the subject, and the percentage of agreement (80%) among experts was adopted for the validity of the behavioral goal, which reached in its final form (34) goals.

Among the research requirements is the preparation of a tool to measure the variable, which is represented in the understanding of biological concepts, in order to determine the extent to which the research objectives and hypothesis are achieved, and this was done according to the following steps:

[16] Abdullah Abu-Haif, "The Effect of Using the English Language as an Educational Means of Communication in Teaching Educational Techniques at Ajman University of Science and Technology from the Point of View of Students and Members of the Faculty," *Damascus University Journal* 22, no. 2 (2006).

Where the test was prepared with the aim of measuring the degree of students' understanding of the biological concepts included in the experimental material. The objective test, the multiple-choice type, was chosen to distance oneself from subjectivity and because it is more suitable for measuring concepts and is suitable for students who may suffer from weakness in the language, reading and writing (English), as it is characterized by high reliability and reliability [17]. In the light of the analysis of the study material, 10 basic concepts were identified, and (03) behavioral goals were formulated that cover the level of understanding of biological concepts. Thus, the test items amounted to (30) test items of the multiple choice type, with three alternatives for each item.

In correcting the test answers, the system (1, 0) was adopted. If the answer to the paragraph is correct, one score is given, and zero when the answer is wrong or left out, or when choosing more than one alternative, and thus the total test score is (03). One of the important characteristics that the test must have is validity, which is its measurement of the thing for which it was set [18]. To verify the validity of the test, the following steps were adopted:

1. Apparent validity: It is the general appearance of the test in terms of formulating the type and formulation of the paragraphs and the clarity of the instructions, meaning that it appears from the appearance of each paragraph that it measures what it was designed for [19], and to achieve this, the test was presented with a list of main concepts to a number of experts and specialists in science Life and methods of teaching it, and the percentage of agreement (80%) and above was adapted from the opinions of experts, and some paragraphs were modified to reach the final version of the test.
2. Validity of the content: It means that the test questions represent all the objectives of the studied material in full [20], where the test was presented with its paragraphs, behavioral objectives, and the content of the study material to a group of experts and specialists in life sciences and teaching methods to show the extent of conformity of the test and its achievement of the content of the material study, and the test that was true to their opinion in terms of content was counted because it was consistent with what was mentioned.

[17] Nabil Abdul-Hadi, *Introduction to Educational Measurement and Evaluation and Its Use in Classroom Teaching*, *Dar Wael for Publishing and Distribution, Amman, Jordan*, 2nd Editio, vol. 32 (Dar Wael for Publishing and Distribution, Amman, Jordan, 2002).

[18] Ramziyya Al-Gharib, *Psychological and Educational Assessment and Measurement* (The Anglo-Egyptian Bookshop, Cairo, Egypt, 1996).

[19] Abdul Wahid Al-Kubaisi, "Measurement and Evaluation, Renewals and Discussions," *Jarir House for Publishing and Distribution, Cairo, Egypt*, 2007.

[20] Salih Muhammad Ali Abu-Jado, *Educational Psychology*, *Dar Al Masirah for Publishing, Printing and Distribution, Amman, Jordan*, 8th Editio (Dar Al Masirah for Publishing, Printing and Distribution, Amman, Jordan, 2011).

3. Constructive validity: Constructive validity refers to the characteristics of the test items based on statistical analysis, represented by calculating the coefficients of the items in terms of difficulty, distinction, and effectiveness of alternatives [21].

To identify the extent of the test's readiness in terms of the time it takes to answer, verify the clarity of the paragraphs and instructions, and diagnose the paragraphs in terms of ease or difficulty, the researcher applied the test on (3/25/2023) on an exploratory sample consisting of (23) students from the second intermediate grade of Al-Manar School Eligibility (bilingual), where the clarity of instructions and paragraphs was confirmed, and the average response time ranged between (30-40) minutes, with an average of (35) minutes.

The statistical analysis of the test items includes examining the students' answers to each item and determining the degree of difficulty or ease for each item and its effectiveness in distinguishing between individual differences for the trait to be measured, as well as revealing the effectiveness of wrong alternatives [22]. The survey sample and correcting the answers The level of difficulty, discrimination, and the effectiveness of the alternatives were calculated as follows: 1) Difficulty score for the test items: It is a value that represents the percentage of students who answered the question correctly, and it is used to identify the ease or difficulty of a question [23]. Where the difficulty coefficient for the test items was calculated using the test difficulty formula, and it ranged between (0.29 - 0.72), which is an acceptable degree for all items [24].

2) The discriminatory power of the test items: It means the differential power of the test items between the upper and lower levels of students in the feature that it measures [25], and when calculating the power of discrimination for the test items ranged between (0.32-0.58), which are acceptable percentages for all items. 3) The effectiveness of wrong alternatives: It is the extent of the ability of alternatives to distract students from the correct choice [26], and it is calculated using the equation for the effectiveness of alternatives. It ranged between (-0.3 - -0.32), which are acceptable percentages for all alternatives. 4) Test stability: It means that the test gives the same results when it is repeated on the same sample and under the same conditions [27]. The (Kyoder-Richardson-21) equation was used to find the reliability coefficient and the extent of internal

[21] John P Robinson and P Shaver, "Measures of Social Psychological Attitudes (Survey Research Center," *Institute for Social Researh Revised Edition*, 1973.
[22] Suleiman and Allam, "Measurement and Evaluation in the Human Sciences."
[23] Sawsan Shaker Majeed, "Foundations of Building Psychological and Educational Tests and Measures," *Debono Center for Teaching Thinking*, 2014.
[24] Al-Kubaisi, "Measurement and Evaluation, Renewals and Discussions."
[25] Abu Libda and Sabaa Muhammad, "Principles of Psychological Measurement and Educational Evaluation" (Amman, Jordan, 2000).
[26] Libda and Muhammad.
[27] Sabah Hussein Al-Ajili, "Principles of Educational Measurement and Evaluation," *Ahmed Al-Dabbagh Office for Printing, Baghdad, Iraq*, 2001.

consistency for its items, given that all items of the test are objective and include The answer is one of the two possibilities (1, 0), i.e. one degree for the correct answer and zero for the wrong answer [28], and the calculated stability coefficient reached (0.80), which is an acceptable degree of stability, and thus the test is ready to be applied to the research sample in a subject The search is from the book (Biology) scheduled for the academic year (2022-2023 AD) in distinguished schools.

The biological concepts comprehension test was applied to the research sample represented by the students of the second intermediate grade of Ghanem Hammoudat School for the Distinguished on Monday corresponding to (4/26/2023), then the answers were corrected according to the standard answer by giving one degree for the correct choice and zero for the wrong choice or the left or set paragraphs More than one alternative, then the results were recorded and processed statistically. Ease score equation: It was used to find the degree of difficulty of the test items.

$$S= \frac{Tu+Ti}{2N}$$

whereas:

Tu: the number of correct answers for the upper group

Ti: the number of correct answers for the lower group

2N: the number of students in the two groups [29].

-Excellence Equation: It was used to find the degree of excellence for the test items:

$$d= \frac{Tc - Ac}{N}$$

whereas:

Tc: The number of correct answers for the upper group

Ac: The number of correct answers for the lower group

N: the number of members of one of the two groups [30]

Efficacy of Alternatives Equation: It was used to determine the effectiveness of alternatives for the test items.

$$Af= \frac{To - Ao}{N}$$

whereas:

Af: Effectiveness of alternatives

To: The number of those who chose the alternative from the upper group

Ao: The number of those who chose the alternative from the lower group

[28] Muhammad Mustafa Al-Absi, *Realistic Evaluation in the Teaching Process*, *Dar Al-Masira for Mushar, Distribution and Printing, Amman, Jordan* (Dar Al-Masira for Mushar, Distribution and Printing, Amman, Jordan, 2010).

[29] Musa Al-Nabhan, "The Basics of Measurement in Behavioral Sciences," *Dar Al-Shorouk for Publishing and Distribution, Amman*, 2004.

[30] Ihsan Aliwi Al-Dulaimi and Adnan Muhammad Al-Mahdawi, *Measurement and Evaluation in the Educational Process*, 2nd editio (Documents and Books House, Baghdad, Iraq, 2005).

N: the number of members of one of the two groups[31] .

- KR-21 equation: used to find the stability coefficient of the test.

$$(KR-21)=\frac{n}{n-1}\left(1-\frac{X^{-}(n-X^{-})}{nS_x^2}\right)$$

whereas :

N: the number of vertebrae.

X-: the arithmetic mean of the individuals

Sx2: the variance of the total score of individuals .

- T-test formula for one sample: It was used to measure the degree of understanding of biological concepts in the sample.

$$t=\frac{x^{-}-m^{0}}{\frac{s}{\sqrt{n}}}$$

whereas:

X-: the arithmetic mean of the sample

M0: the arithmetic mean of the population

S: standard deviation

N: the number of the sample

- T equation for two independent samples: used to compare understanding of biological concepts according to the sex variable.

$$t=\frac{X_1^{-}-X_2^{-}}{\sqrt{\frac{(n_1-1)S_1^2+(n_2-1)S_2^2}{n_1+n_2-2}\times(\frac{1}{n_1}+\frac{1}{n_2})}}$$

whereas :

n1, n2: the number of students in the two research groups.

X1-, X2-: the arithmetic mean of the two research groups.

S12, S22: The contrast of the two research groups [32].

Presentation and Discussion of Search Results

The results related to the first zero hypothesis: which states that "there is no statistically significant difference at the level of significance (0.05) between the average scores of students in the test of comprehending biological concepts who were taught in English and the hypothetical mean", where the researcher verified this hypothesis by extracting the mean The arithmetic score of the students in the biological concepts comprehension test and its comparison with the hypothetical arithmetic mean, which was determined based on the instructions of the Ministry of Education, represented by a score of 75%, then the t-test was applied for one sample, and the data were included in Table (1) below:

[31] Ihsan Aliwi Al-Dulaimi and Adnan Muhammad Al-Mahdawi, *Measurement and Evaluation in the Educational Process*, 2nd editio (Documents and Books House, Baghdad, Iraq, 2005).

[32] Al-Nabhan.

Table 1. The results of the test (t-test) for the arithmetic mean and standard deviation of the research group in the biological concepts comprehension test

Group	Number	Arithmetic mean	Standard deviation	Value t		Significance
				calculated	Tabular	
Group	32	18.87	4.78	-4.23	1.697	There is an indication
hypothesis value		22.5				

By observing the above table, it appears:

- The calculated t-value amounted to (4.23), which is greater compared to the tabular value of (1.697) at the level of significance (0.05) and the degree of freedom (31), i. And the hypothetical value, and the alternative hypothesis is accepted, which is the existence of a statistically significant difference between the students' results in the biological concepts comprehension test between the hypothetical value specified by the Ministry and in favor of the hypothetical mean, that is, the use of English in teaching second-grade intermediate students in distinguished schools did not achieve the specified minimum level of comprehension Biological concepts by the Ministry, which is 75%. This is consistent with the results of previous studies, which indicated a weakness in achievement or the existence of problems in the formation of scientific concepts among students who are taught using a foreign language: [33].

-Second: The results related to the second zero hypothesis: which states that "there is no statistically significant difference at the level of significance (0.05) between the average scores of male and female students in the test of comprehending biological concepts who were taught in English", where the researcher verified this hypothesis by extracting the mean The arithmetic scores of male students in the understanding of biological concepts test and compared with the arithmetic mean of the scores of female students for the test, then the t-test was applied to two independent samples, and the data were included in Table (2) below:

Table 2. Students' results in the biological concepts comprehension test according to the gender variable

Group	Number	Arithmetic mean	Standard deviation	Value t		Significance
				calculated	Tabular	

[33] Kiraz et al., "Effect of Science and Technology Learning with Foreign Langauge on the Attitude and Success of Students"; Kocakulah, Ustunluoglu, and Kocakulah, "The Effect of Teaching in Native and Foreign Language on Students' Conceptual Understanding in Science Courses"; Mesbaah and Mutawa'a, "Arabization and the Problem of Using English Language as a Medium of Educational Communication in the Faculty of Sciences, Kuwait University"; Salim, "Using Some Strategies for Teaching Science in English to Develop Scientific Concepts and the Survival of the Impact of Their Learning among Primary School Students in Experimental Language Schools."

male	17	19.12	5.48	0.32	2.042	There is no indication
female	15	18.57	3.96			

Observing the above table shows:

The calculated t-value was (0.32), which is a lower value compared to the tabular value of (2.042) at the level of significance (0.05) and the degree of freedom (31), i.e. the null hypothesis is accepted indicating that there is no difference in the results of the students' understanding of biological concepts test according to the gender variable That is, there is no difference between male and female students in the degree of their comprehension of biological concepts, and this neutralizes the gender variable in terms of the possibility of its impact on their comprehension degree.

Conclusion

The results of this research indicate the existence of problems in teaching sciences, including life sciences, in English in distinguished schools in Iraq, and this confirms the results of research similar to experiences in neighboring countries such as Kuwait, Saudi Arabia and Turkey [34], as well as global experiences such as Malaysia's experience in teaching science and technology in the Malay language [35]. This calls for the intensification of research in this field to find out the variables that negatively affect the process of teaching science in the English language and that are negatively reflected in their understanding of its concepts, whether they are related to teachers, curricula, or students, which ultimately helps to re-evaluate this experience in the light of the results of this research, especially since The experience of teaching science to students in a language other than the mother tongue has been the subject of controversy since the beginning, whether for national considerations related to identity or objective ones related to the scientific feasibility of this experience based on empirical research.

Recommendations

The need to re-evaluate the teaching of science in English in the schools of the privileged, after conducting additional research in this field. Complementing the current research, the researcher suggests conducting additional studies to identify the impact of teaching in English on the achievement of additional scientific subjects such as chemistry and physics.

[34] Muhammad Al-Harfy, "Elementary Schools and Teaching English. A Look of Contemplation," *Al-Watan Newspaper*, 2020; Kocakulah, Ustunluoglu, and Kocakulah, "The Effect of Teaching in Native and Foreign Language on Students' Conceptual Understanding in Science Courses."

[35] Majdi Al-Hajj Ibrahim, "Linguistic Identity in Science and Mathematics Education, the Malaysian Experience as a Model," *Al-Tajdid Magazine* 12, no. 24 (2008): 113–1148; Mommed Alzyoudi et al., "Phonological Process in Arabic-Speaking Children with Down Syndrome: A Psycholinguistic Investigation," *Africa Education Review* 19, no. 1 (2022): 1–14.

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