



# مجلة القلزم للدراستات التطبيقية



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علمية دولية محكمة - تصدر بالشراكة مع جامعة دنقلا - السودان

## في هذا العدد:

□ عناصر التروجين والفسفور والبوتاسيوم الموجودة في أوراق شجيرة الفبيش  
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□ تطوير الخدمات المصرفية وأثرها على التنمية الاقتصادية  
(دراسة حالة مصرف الخرطوم 2015م - 2017م)  
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□ أثر التسويق الالكتروني على جودة الخدمات المصرفية  
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□ Investigating Reading Comprehension Problems among EFL learners  
(A case study at Port Sudan Town)  
Dr. Suad Abdelwahid Fadlalla - Osman Alnor Abker Ahmed

□ Investigating the Problems of Learning Mechanical Engineering  
Terms in Arabic and English  
Intisar Ibrahim Mohamed Elshiek



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تحمل وجهة نظر كاتبها ولا تعبر بالضرورة عن آراء المركز

ترسل الأوراق العلمية على العنوان التالي  
هاتف: +249121566207 - +249910785855  
بريد إلكتروني: [rsbcrsc@gmail.com](mailto:rsbcrsc@gmail.com)  
السودان - الخرطوم - السوق العربي  
عمارة جي تاون - الطابق الثالث



# موجهات النشر

## تعريف المجلة:

مجلة (أقلزم) للدراسات السياسية والقانونية، مجلة علمية مُحكمة، تصدر عن مركز بحوث ودراسات دول حوض البحر الأحمر. تهتم المجلة بالبحوث والدراسات التي تخص حوض البحر الأحمر والدول المطلة عليه والمواضيع ذات الصلة.

## موجهات المجلة:

1. يجب أن يتسم البحث بالجودة والأصالة، وألا يكون قد سبق نشره قبل ذلك.
  2. على الباحث أن يقدم بحثه من نسختين. وأن يكون بخط (Traditional Arabic) بحجم 14 على أن تكون الجداول مرقمة وفي نهاية البحث وقبل المراجع على أن يشار إلى رقم الجدول بين قوسين دائريين ().
  3. يجب ترقيم جميع الصفحات تسلسلياً بالأرقام العربية بما في ذلك الجداول والأشكال التي تلتحق بالبحث.
  4. المصادر والمراجع الحديثة يستخدم أسم المؤلف، اسم الكتاب، رقم الطبعة، مكان الطبع، تاريخ الطبع، رقم الصفحة.
  5. المصادر الأجنبية يستخدم اسم العائلة (Hill, R).
  6. يجب ألا يزيد البحث عن 30 صفحة، وبالإمكان كتابته باللغة العربية أو الإنجليزية.
  7. يجب أن يكون هناك مستخلص لكل بحث باللغتين العربية والإنجليزية على ألا يزيد على 200 كلمة بالنسبة للغة الإنجليزية. أما بالنسبة للغة العربية فيجب أن يكون المستخلص وافياً للبحث بما في ذلك طريقة البحث والنتائج والاستنتاجات، مما يساعد القارئ العربي على استيعاب موضوع البحث وبما لا يزيد عن 300 كلمة.
  8. لا تلزم هيئة تحرير المجلة بإعادة الأوراق التي لم يتم قبولها للنشر.
  9. على الباحث إرفاق عنوانه كاملاً مع الورقة المقدمة (الاسم رباعي، مكان العمل، الهاتف، البريد الإلكتروني).
- نأمل قراءة شروط النشر قبل الشروع في إعداد الورقة العلمية.

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

الحمد لله رب العالمين، والصلاة والسلام على سيدنا محمد  
وعلى آله وصحبه أجمعين

وبعد:

### القارئ الكريم ..

السلام عليكم ورحمة الله وبركاته.. نطل على حضراتكم من نافذة  
جديدة من نوافذ النشر العلمي، وهي **مجلة القلزم للدراسات  
التطبيقية**، ونحن في غاية السعادة والمجلة تصل عددها السادس  
بفضل الله تعالى ومنتته.

### القارئ الكريم:

هذه المجلة تصدر بالشراكة مع جامعة دنقلا، وهي إحدى الجامعات  
السودانية الفتية التي وضعت بصمات مميزة في مسيرة البحث العلمي،  
وهذا العدد هو السادس في إطار هذه الشراكة العلمية التي تأتي  
في إطار استراتيجية مركز بحوث ودراسات دول حوض البحر الأحمر، في  
تفعيل الحراك العلمي والبحثي داخل السودانى وخارجه.

### القارئ الكريم:

هذا العدد يشتمل على العديد من البحوث والدراسات المهمة ذات  
البعد النظري والتطبيقي، ولضمان نجاح واستمرارية هذه المجلة بإذن  
الله تعالى، نأمل أن يرفدنا الباحثون بمزيد من إسهاماتهم العلمية  
المميزة.

مع خالص الشكر والتقدير للجميع

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# Investigating the Problems of Learning Mechanical Engineering Terms in Arabic and English

(A Case Study of Students of the Faculty of Mechanical Engineering University of Khartoum, University of Sudan of Science of Technology and University of Gezira)

■ Intisar Ibrahim Mohamed Elshiek

## Abstract:

This study aims to investigate the Investigating the problems that face ME students in learning mechanical engineering terms in Arabic and English at the Faculty of Mechanical Engineering, University of Khartoum. The main hypothesis is that many teachers and students show a variety of attitudes towards mechanical engineering instructions. This study follows the descriptive-analytical approach. The sample consisted of (30) teachers and (60) students. Two tools of data collection were used; a questionnaire and an observation checklist. (SPSS) was used to analyze the data. The study found the lack of specialized and standardized resources in Sudanese universities hinder students learning outcomes. The study recommends that teachers should use some diversified, useful and effective strategies in mechanical engineering terms instructions.

**Key words :** investigation - mechanical engineering – attitudes - hinder

# التحقق في مشاكل تعلم مصطلحات الهندسة الميكانيكية باللغتين العربية والانجليزية

(دراسة حالة طلاب كلية الهندسة الميكانيكية جامعة الخرطوم،  
وجامعة السودان للعلوم والتكنولوجيا ، وجامعة الجزيرة)

أ. إنتصار إبراهيم محمد الشيخ - باحث

## المستخلص:

تهدف الدراسة للتحقق من المشاكل التي تواجه الطلاب في تعلم المصطلحات التقنية في كلية الهندسة التقنية في جامعة الخرطوم. من الفرضيات الأساسية للدراسة يبدي الطلاب والمعلمين عدد من المواقف المختلفة تجاه تعلم المصطلحات التقنية. إتبعت الدراسة المنهج الوصفي التحليلي بالإضافة للإستبيان وقائمة الملاحظة في جمع البيانات من العينة المكونة من (309) معلماً و (60) طالباً كما أُستخدم البرنامج الإحصائي للعلوم الاجتماعية لتحليل البيانات. توصلت الدراسة إلى نتائج أهمها أن نقص المصادر المختصة والموحدة وراء إعاقه نتائج التعلم. توصي الدراسة المعلمين لإستخدام استراتيجيات متنوعة ن مفيدة ومؤثرة لتدريس مصطلحات الهندسة التقنية.

كلمات مفتاحية : تحقيق - هندسة ميكانيكية - اتجاهات - يعرقل.

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# CHAPTER ONE

## INTRODUCTION:

### 1.0 Background:

Scientific terminology is of a vital importance in the educational process since they are the vessel of special agreed set of words that express a scientific concept or notion. Thus, one language for teaching and sufficient university books nevertheless are pillars of a healthy schooling environment for all students, in particular students of ME.

Despite the government formal decision on February 1991 on the Arabization of Higher Education Institutions, English terms and references have already been equivalent into Arabic; English persists as the preferred language of most Sudanese academics and university students. Actually, many teachers use Arabic in teaching their subjects while others teach in English in the same class.

### 1.1 Statement of the Problem:

In the last few decades, it has been noticed that students of ME performance has deteriorated. This may be connected to dealing with learning in two languages, Arabic and English in the classroom. Furthermore, the lack of specialized and standardized resources hinder students learning outcome.

### 1.2 Objectives of the Study:

1. To explore the significance of learning mechanical engineering terms
2. To find out which instruction language do students prefer in classroom when learning MET English or Arabic.
3. To detect problems that faced by students when learning MET

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### **1.3 Questions of the Study:**

1. What is the significance of learning mechanical engineering for students?
2. To what extent learning in one language improves student's performance at university level.
3. How far does the lack of specialized references hinder students of ME learning process?

### **1.4 Hypotheses of the Study:**

1. Students of ME are not aware of the significance of learning mechanical engineering
2. Studying in Arabic instead of English has a negative impact on students' performance.
3. Lack of specialized and updated ME references and standardization of equivalent terms hinder learning of the mechanical engineering terms.

### **1.5 Significance of the Study:**

This study will be of great value to those who are interested in the field of translation and Arabicization as well the findings of the study can be of a great importance in changing teachers of ME attitudes towards the teaching methods.

### **1.6 Methodology of the Study:**

The descriptive-analytical method will be used. The sample of this study will be selected randomly. The population of the study consisted of three groups. The first group included (20) twenty ME university teachers. The second group comprised (60) sixty ME students. The third group contained (10) teachers of grade five mechanical engineering at Faculty of ME, University

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of Khartoum, University of Sudan and University of Gezira. Two tools of data collection will be used; a questionnaire and an observation checklist.

### **1.7 Limits of the Study:**

The topic of the study is limited to ‘An Investigation into the Classroom Interaction when Learning MET into Arabic and English at University of Khartoum, University of Sudan and University of Gezira. The study will be conducted during the academic year (2019-2022).

### **1.8 Terms and abbreviations.**

ME stands for Mechanical Engineering

MET stands for Mechanical Engineering Terms

## **CHAPTER TWO**

### **Literature Review:**

#### **2.1 Introduction :**

Terminology is not a completely new field of study. The theory of terminology has been a subject of debates in various fields. Just recently, it has been systematically developed with full consideration of its principles, bases and methodology. In this chapter, the researcher will review the literature related to the history of terminology, the concept, and other related issues to the field of terminology.

#### **2.2 Historical Development in the Field of Terminology:**

In the 18<sup>th</sup> and 19<sup>th</sup> centuries, scientists were the leaders in terminology. They were mainly alarmed by the proliferation of terms. They were worried about

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the diversity of forms and the relationships between forms and concepts. Neither the nature of concepts nor the foundations for creating new terms were of concern to them. (Sajer, 1999:12)

In the 20<sup>th</sup> century, engineers and technicians became involved. Rapid progress and the development of technology required not only the naming of new concepts but also agreement on the terms to be employed. Because of practice, terminological work began to be organized in certain specialized fields.

Alain (1995:8) states that during the first half of the 20<sup>th</sup> century, neither linguists nor social scientists paid special attention to terminology. Terminology, as it is understood today, first began to take shape in the 1930s. The work of Eugen Wüster, an Austrian linguist considered a father of terminology, was very important for the development of modern terminology. In his doctoral dissertation in 1930, he presented arguments for systematizing working methods in terminology. He also established a number of principles for working with terms and outlined the main points of a methodology for processing terminological data.

The significance role of terminology in the modernization of language became apparent in this period. Moreover, the spread of personal computers brought about a major change in the conditions for processing terminological data.

## **2.3 Traditional View on Terminology:**

While the view of traditional terminologists had been unquestioned for a long time, their principles started to be questioned and criticized at the end of 20<sup>th</sup> century. The main purpose of traditional terminology was to assign a new term to a new concept that appeared in a language. In the naming process, terminologists started from the concept, which they placed into a concept system, on the basis of which it had been defined before being named as a

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term (the onomasiological approach). Their focus was on exploring the ways in which to make terminology as efficient and unambiguous as possible.

The views on terminology as a scientific discipline vary considerably, and there are currently a number of treatments of this field. Some scholars say it is a science. Others think it is just a practice a daily work. As many theories say, terminology have a status of a separate scholarly discipline with its own theory and owe its theoretical assumptions to more consolidated disciplines. (Chovanec; 2005:55).

To conclude, it can be said that traditional terminology had a number of dogmatic principles, confused the principles with facts and converted wishes into reality. It failed to create a theoretical framework that would support its own principles and methods. In essence, the interests of standardization impeded research.

## **2.4 The view of Terminology as a Science, an Art or a Practice:**

Alain (1995:19) mentions that not all experts agree that terminology constitutes a separate scientific discipline, nor do they all consider it a theoretical subject. For some, terminology is a practice dealing with social needs that are related to political and/or commercial ends. In the opinion of others, terminology is a true scientific discipline that owes much to the other subject fields, from which it borrows fundamental concepts. It is, nevertheless, considered a separate discipline in the sense that it has reformulated and synthesized the original foundations so that it could build its own field. There are many intermediate positions, the advocates of which, although admitting that terminology contains some original theoretical features, are persuaded that it only conceives of them within the framework of other, more consolidated disciplines.

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Richard and Wright (1993:24) see it as the art of analyzing terms in context and the systematic study of naming and labelling concepts with the aim of developing vocabulary for a given field.

## **2.5 Standarization of the Scientific Terminology:**

Terminology is considered of great importance in all sciences. It is defined by Al-Khwarizmi, (1993: 43) as “the key of sciences”. Al- Qassimi (2004) argues that understanding terminology is half of science, because “the term is a word that expresses a concept, and knowledge is a set of concepts that are related to each other in the form of a system.” He adds that the terminology is necessary for the scientific approach, as the latter cannot be correct unless it is built on precise terminology.

Peter (1995:90) asserts that many people are not aware of terminology, and some of them neglect it for a reason or another. In other words, academicians and academics have not conducted a survey of what was actually used in the scientific field prior to developing their new terminology. The terminology of Arab academicians, academics and scholars remains in the textbooks because unfortunately, the majority of the Arab masses are still illiterate, or because these publications are not widely spread. Thus, the public continues to use irregularly borrowed words.

## **2.6 Characteristics of the Standard Terminology:**

There are agreed upon characteristics of standard terminology Al-Hamzawi, (1985:41) illustrates that the goal of the Arabic standard terminology is to customize every concept of a scientific terminology to an Arabic terminology to be chosen from among the multiple synonyms. The methodologies of the Arab linguistic and scientific academies summarize this subject in four charactersitics; steadiness, easy circulated, appropriateness and accessibility.

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## 2.7 Challenges of learning in Mechanical Engineering:

One of the greatest challenges that studying mechanical engineering presents is the absence of the platform to conduct practicals, workshops, seminars and laboratory experiments (Thomson, 2011:69). According to a similar study by Morris (2015:41), this phenomenon is because of the lack of home-based learning, and many students cannot afford to have their home-based labs or even conduct many of the necessary experiments at home. Thus, students who study engineering and many of the Science, Technology, Engineering, and Mathematics (STEM) courses through practical platforms have these disadvantages as they learn using school-based systems. A general belief is that practical learning is effective for students in full-time work, who strive to balance their commitments towards their jobs with those towards their education (Kim et al, 2005:85).

## 2.8 The strategies of learning engineering terms:

Several strategies that both learners and providers of learning can use to make it more effective within the engineering education perspective. Thomson (2011:45) suggested that creating and maintaining an effective course site would be crucial to provide good support to learners as well as to provide timely feedback. This would ensure that learners of engineering, who are usually rushing to beat time deadlines, do not suffer delays from a malfunctioning site. Fandl and Smith (2014) recommend that it is crucial for instructors and online learners to maintain a close communication so that queries and feedback are offered smoothly and efficiently. This study stated that this close relationship ensures excellent performance for the learners.

To sum up, terminology is a scientific field of great importance. Many scholars say it is a systematic study of naming and labelling concepts with the aim of developing vocabulary for a given field. It has been developed by linguists from traditional point to meet the modernized and standardized requirements of jobs.

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## CHAPTER THREE

### Methodology of the Study:

#### 3.1 Population of the Study:

The population of the study consisted of three groups. The first group included (20) twenty ME university teachers. The second group comprised (60) sixty ME students. The third group contained (10) teachers of grade five mechanical engineering at Faculty of ME, University of Khartoum, University of Sudan and University of Gezira.

#### 3.2 Sample of the Study:

The sample of this study was selected randomly. It consisted of three groups; teachers and students of mechanical engineering at Faculty of ME, University of Khartoum, University of Sudan and University of Gezira. The sample took place in, Gezira and Khartoum States in the academic year 2019 -2022.

#### 3.3 Tools of Data Collection:

Two tools of data collection were adopted to support the study; a questionnaire and observation checklist.

##### 3.3.1 The Questionnaire:

The researcher designed two questionnaires for both the teachers and students. The questionnaires aimed at measuring the different attitudes of Sudanese university mechanical engineering teachers and students in ME terms instructions.

##### 3.3.1.1 The Validity of Questionnaire:

The questionnaire was shown to a panel of three university professors. The final form of the questionnaire was drawn out after taking their comments, opinions, and advice into consideration.

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### 3.3.1.2 The Reliability of Questionnaire:

A pilot experimentation of the questionnaire was performed on faculty of mechanical engineering students. Reliability of the questionnaire was calculated using the internal consistency estimate of reliability. The calculated Cronbach's Alpha was (0.75) for both teachers' and students' questionnaire.

#### Reliability Statistics

Cronbach's Alpha	No of Items
.750	18

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$$a = \frac{k}{k-1} \left(1 - \frac{\sum r}{s}\right)$$

The analysis of Cronbach's Alpha is (0.75) of the two questionnaires which reveals that there is a strong correlation.

### 3.3.2 The Observation Checklist:

The researcher attended (10) ten lectures in ME level (5) classroom using a checklist to find out students understanding lessons given in both Arabic and English. The aim of the observation checklist is to observe and collect primary data in a systematic and a purposeful way of watching and revising the students' learning of ME terms.

#### 3.3.2.1 The Validity of the Observation Checklist:

In order to ascertain and construct its validity, the observation checklist was shown to a senior EFL lecturer. He is a Ph.D. holder in English, his remarks and suggestions regard formatting and organization, of the checklist, are highly valuable.

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### 3.4 Data Analysis:

The data which were collected for this study were analyzed by using Statistical Packages for Social Science Program (SPSS).

## CHAPTER FOUR

### Data Analysis and Discussion:

#### 4.0 Introduction:

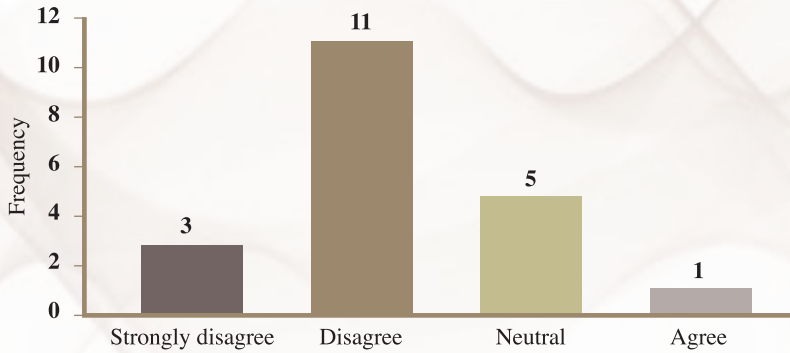
In this chapter, the data was analyzed, discussed and interpreted based on the results of both the teachers and students' questionnaire and the observation checklist.

#### 4.1 Analysis of the Questionnaire:

This section attempts to explore the attitudes of EFL teachers towards mechanical engineering terminologies instruction. The questionnaire consisted of (9) nine statements accompanied by five options; strongly disagree and disagree, neutral, strongly agree, agree

**Table (4.3) The political decision of Arabization of Higher Education improved student's Academic outcome.**

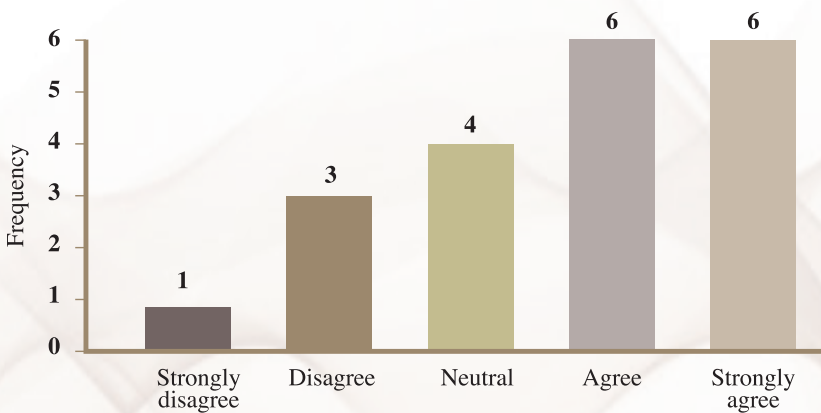
Aalid	Frequency	Percent
Strongly disagree	8	40.0
Disagree	6	30.0
Neutral	1	5.0
Agree	1	5.0
Strongly agree	4	20.0
Total	20	100.0



The analysis regarding this statement reveals (40.0%) of the respondents are strongly disagree and (30.0%) are disagree. The results indicate the majority of the respondents disagree with that political decision has not any effects on Arabization on improving student's Academic outcome.

**Table (4.4) The Arabization decision is implemented fully by teachers in your University.**

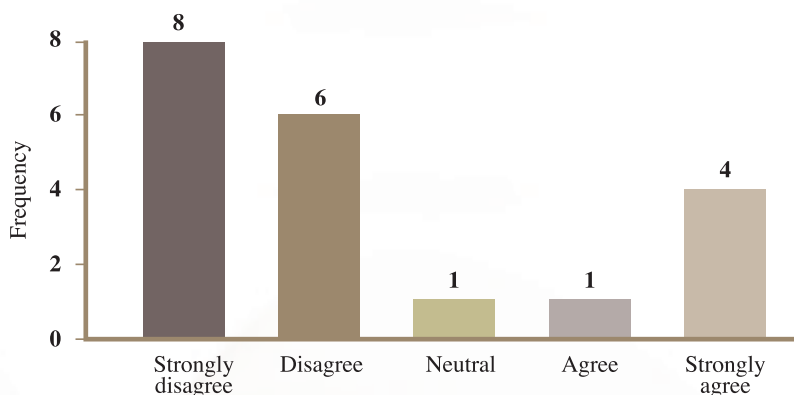
Aalid	Frequency	Percent
Strongly disagree	3	15.0
Disagree	11	55.0
Neutral	5	25.0
Agree	1	5.0
Total	20	100.0



The analysis of the above table shows (55.0%) of the respondents are disagree to the above statement, (15.0%) strongly disagree while (25.0%) are neutral. This means that Arabization or using mother language in teaching these terms are not implemented by teachers.

**Table (4.5) and Classroom interaction to instruction language in English is**

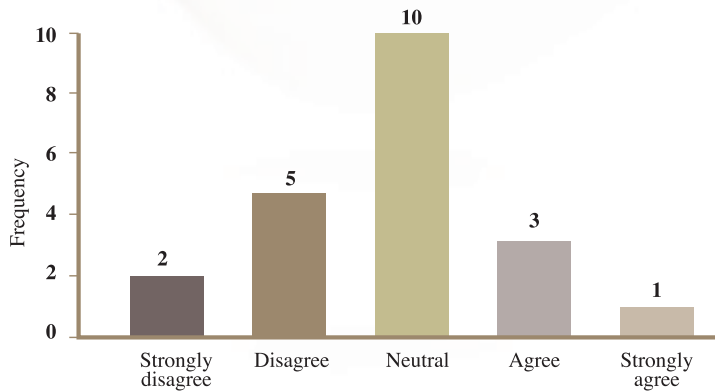
Aalid	Frequency	Percent
Strongly disagree	2	10.0
Disagree	5	25.0
Neutral	9	45.0
Agree	3	15.0
Strongly agree	2	5.0
Total	20	100.0



The analysis of table (4.7) reflects (25.0%) of the respondents are disagree and (10.0%) are strongly disagree, while (45.0%) are neutral to the above statements. The majority of the responses reveal that classroom interaction is not achieved when using English in instruction.

**Table (4.6) Lack of specialized references costs more time and efforts in lesson preparation**

Aalid	Frequency	Percent
Strongly disagree	1	5.0
Disagree	3	15.0
Neutral	4	20.0
Agree	6	30.0
Strongly agree	6	30.0
Total	20	100.0



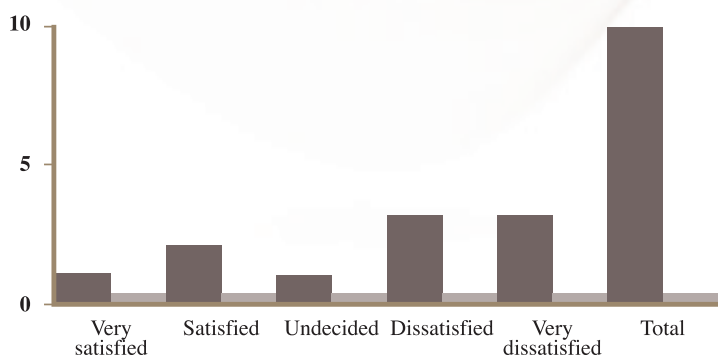
The analysis of the above table shows (30.0%) of the respondents are strongly agree and (30.0%) are agree with the above statement. The results reveal the problem of the lack of the exact references, which will help the teachers in preparing their lessons well.

### 4.3 Analysis of the Observation Checklist:

The researcher proposed an observation checklist to collect information from teacher regarding using Arabic and English language in instruction.

**Table (4.7) the students' understanding of lectures taught in Arabic is.**

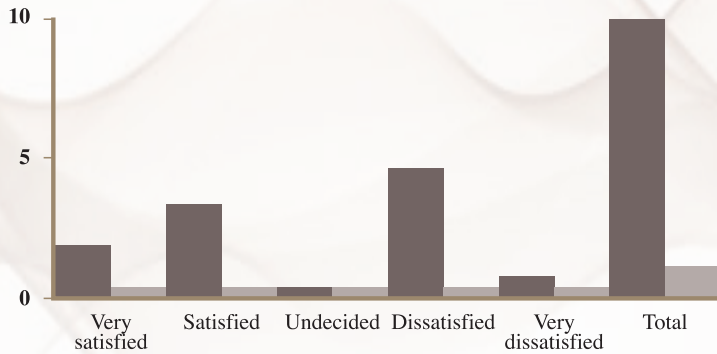
Aalid	Frequency	Percent
Very satisfied	1	10.0%
Satisfied	2	20.0%
Undecided	1	10.0%
Dissatisfied	3	30.0%
Very dissatisfied	3	30.0%
Total	10	100.0%



The analysis of the above table shows that (30. %) of the respondents are very dissatisfied, (30. %) are satisfied, (10. %) are undecided to the above statement. The results indicate the majority of the respondents do not prefer to be taught their subjects in Arabic language.

**Table (4.20) and figure (4.20) the students' understanding of lectures taught in English is.**

Aalid	Frequency	Percent
Very satisfied	2	20.0%
Satisfied	3	30.0%
Undecided	0	0.0%
Dissatisfied	4	40.0%
Very dissatisfied	1	10.0%
Total	10	100.0%



The results of the above table shows (40. %) of the participants dissatisfied, (30. %) satisfied, and (20. %) of the teachers are very satisfied to the above statement. The results also reveal that the students who their level in English are able to comprehend their subject and receive studying in English.

## Discussion of the Results in Relation to the Hypotheses of the Study

### 4.0 Hypothesis (1) Students of ME are not aware of the significance of learning mechanical engineering:

The analysis of the questionnaire and the observation checklist reveal the majority of the students face problems when learning in two languages Arabic and English. Moreover, they are not aware of the significance of using which language in their subjects' instructions. These responses show the importance of translated mechanical engineering terms in increasing students' comprehension of scientific subjects.

### 1. Hypothesis (2) Students performance hinder when studying in Arabic rather than English language:

In the analysis of the questionnaire and the observation checklist, the results indicate the majority of the respondents prefer to use Arabicization in their teaching and learning of mechanical engineering terms in the classroom.

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Moreover, the results reflect the significance of Arabicization in enhancing students' achievement when learning mechanical terms.

**Hypothesis (3) Lack of specialized and updated ME references and standardization of equivalent terms hinder learning of the mechanical engineering subjects.**

The results of the analysis reveal two problems regarding mechanical terms instructions. The first one is the weak vocabulary knowledge of the students which resulting from the lack of specialized dictionaries in this field. The second problem is the lack of the exact references, which will help the teachers in preparing their lessons well.

## CHAPTER FIVE

### Conclusion, Findings and Recommendations:

#### 5.0 Conclusion:

The study is intended mainly to investigate classroom interaction when learning mechanical engineering terms in Arabic and English. As it is known that mechanical engineering terms acquisition is one of the most challenging obstacles engineering students must overcome. The main problem is that students face difficulties in learning ME terms. The researcher adopted the descriptive-analytical method to carry out this study. Two tools of data collection were used; a teachers' questionnaire and an observation checklist. The study finds out that the students face a number of problems in learning ME terms. Moreover, it reflected the usefulness and effectiveness of using visual aids in teaching and learning these terms.

#### 5.1 Findings:

The findings of the study are as follow:

1. The study finds out that the performance of ME students has deteriorated by the use of two languages in instructions.

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2. The lack of specialized and standardized resources in Sudanese universities hinder students learning outcomes.
  3. Both students and teachers depended entirely on student's textbooks and confined only to the reading passage to teach and learn ME terms.
  4. University students face difficulties in ME acquisition due to the lack of specialized dictionaries.
  5. There a weak classroom interaction when Arabic language is used in instructing, since all references are in English.
  6. The study displayed that some students prefer teaching and learning new ME term in the Arabic language.

## 5.2 Recommendations:

Based on the findings of the study, the researcher recommends with the following:

1. Both teachers and students should give more effort to mechanical engineering terms teaching and learning because of their great importance.
2. Teachers should use some diversified, useful and effective strategies to improve the interaction when learning and using mechanical terms.
3. To teach MET, terms should be grouped into different types of lexical sets such as similar meaning, opposites, derivatives, collocations or multi-word verbs, inclusion and so on.
4. Teachers should avoid to use direct translation in teaching new mechanical terms.

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