BENEMÉRITA UNIVERSIDAD AUTÓNOMA DE PUEBLA

FACULTAD DE LENGUAS

EVALUATION OF ESP MATERIALS DESIGNED ON PROBLEM-SOLVING BASIS AT THE UNIVERSIDAD TECNOLOGICA TULA-TEPEJI

A Thesis Submitted to the School of Languages

For the Degree of
LICENCIATURA EN LENGUAS MODERNAS

By:
Elva Hernández López

Thesis Director:
Dra. Teresa A. Castineira Benítez

Puebla, Pue. November 2014

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This thesis has been read by the members of the thesis committee of

ELVA HERNÁNDEZ LÓPEZ

and is considered worthy of approval in partial fulfillment of the requirement for the degree of

LICENCIATURA

EN

LENGUAS MODERNAS

Dra. Teresa Castineira Benítez

Dr. Michael T. Witten Ulrich

Mtro. Yonatan Puon Castro

Dedication

After graduation in 1997, I was asked about the topic of my thesis, I had no answer to reply, I knew I wanted to do something meaningful for me. As a traditional teacher for sixteen years and getting involved in my students´ needs, I found a subject to be shared with others that made me feel satisfied and help me improve as an English teacher as well. This work represents a new beginning in all aspects, of course challenging but amazing. I put my heart on this work and I really expect to succeed at the end of this thesis.

Thanks god to help me to fulfill this stage of my career, he has made me to trust in myself and to demonstrate myself that I am able to do anything I want and overcome all challenges that have certainly been part of my life.

I also want to thank my mother and my father because they have helped me with their love and support along this project. Dad has been an important part of my life because he has taught me to be strong in adversity and being brave to overcome difficult moment. He is a clear example to go forward even though when you are not well-motivated to carry on and go on despite pain of fear or sadness. I learnt that we have to move on with this and without that. Thanks for being my dad, I really admire you so much. Keep being generous like up to now.

I would like to highlight my mother company in every moment, I own her everything what I am. She has wisely taught me how to face struggles in life to become a better person. Thanks for everything you have done for me. I love you so much.

My brothers and my sisters in law, they have always been nearby and encouraged me in the most difficult moments. Love you guys. Brother Luis, I admire you because you never give up. Deme, I love your tenderness and David, you are my inspiration to keep going. You have showed me that there are no barriers to get what we want and I also admire the way you are, because you are a hard working guy, smart and you are worthy for me and your family. Thanks you guys, I am proud of you all and happy to belong to this wonderful family.

Allison, Chantal, Aisha, Edson and Edwin, thanks guys, you are the best of my life, thanks for the best moment shared with you all. I always have fun when we are together and I hope to be there anytime you need me. Love you so much too.

Thanks to my friends, Sawdy, Martha Patricia, Ramón Alejandro, Minerva, Ivonne, Paty Vargas, Lupita Arrollo, Eva, Luis, Sister Laura, Fabiola and Polo, Inn guys, Mayra, Fer Rosales, Katy, Kim, Uncles Rosas Valdez. May god bless you!

Last but not least, my love, you are the kindest person ever met, I thank God to meet you and I would never forget you were there caring me and supporting me when I needed. Love you!

Yours always Elva

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CHAPTER I: INTRODUCTION

1.1 Background

Due to the increasing growth of new technologies derived from the worldwide globalization, there has been a higher demand for Técnico Superior Universitario students (TSUs) in the Mexican context. TSU students are graduated from the Universidades Tecnológica (UTs), in the case of Hidalgo, Pachuca at the Industrial Maintenance school. Hence, TSUs are strongly asked to be more qualified when solving problems at the industry mainly in situations related of machinery. According to Soden (1994) "modern industry requires workers who are capable of applying their knowledge in a flexible, adaptable way" (p.11); so that, it is needed to teach them thinking skills as well as help them become better problem solvers at the industry. At the same time, TSU students are demanded to have good domain of English, because they constantly keep conversations in English with suppliers and industrial people face to face or by phone to provide advice or opinions about situations seen in the enterprise. They are also asked to provide written reports about certain problematic situations encountered in the workplace.

The setting of this investigation takes place at the UT cited above with TSU students taking their last term of their studies (fifth quarter) and their last English course. For the evaluation of the problem-solving materials, which is the subject of this study, 28 students participated in the materials evaluation process, two of the participants were female and twenty-six were male and they were asked to answer a questionnaire for the materials evaluation in the last day of the course.

The main objective of this paper is the evaluation of materials designed on problem-solving cases based on industrial working situations from the local industry. Hutchinson and Waters (1987) proclaim that "Evaluation is a matter of judging the fitness of something for a particular purpose" (p.96). These problem-solving materials were used as learning/teaching tools and adapted to TSU students in their last English

course. Hence, these materials were implemented by the author of this paper with the intention of trying to cover the present TSU students´ needs to help them describe in English situations related to industrial maintenance field. Robinson (1991) claims that " PSA seeks to establish what the students are like at the start of their language course, investigating their strength and weaknesses" (p.9). Then, this study stated taking into account TSU students´ needs from their Present Situation Analysis (PSA) to implement the Industrial Needs Detection Format (INDF) with problem-solving materials to help them develop ESP skills concerned with industrial working situations from the local industry. Lesh and Doerr (2003) declare that "one way to do this is to have them dealt with realistic problems during their school years" (p.242); in this way, TSU students will be more prepared to reflect on the possible alternatives to solve a real industrial situation using thinking skills in a proper manner since they are at school.

The TSU students´ outcomes generated by the materials evaluation provided important information to support the value of problem-solving materials. Additionally, the results of the analysis of the data utilized will provide valuable feedback on the materials which will determine what can be improved in relation to design, content, authenticity and meaningfulness in the English teaching/learning process. Dickins and Germaine (1992) declare that "teacher man benefit greatly in the evaluation of materials by engaging the help and views of learners" (p.32).

The main instrument used to carry out this investigation was a Yes/No questionnaire in English to evaluate the problem-solving materials. The questionnaire was also used as evaluation criteria in order to examine the theoretical value of the INDF with problem-solving materials. Therefore; this instrument proved to be effective to get the TSU students´ opinions that were crucial to know the effectiveness of then INDF with problem-solving materials when they used the materials in the classroom. The physical presentation of the problem-solving philosophy to materials design was put in the Industrial Needs Detections Format (INDF), which is the focus of this investigation, designed by the researcher. Apart from this, the questionnaire also served as a checklist to evaluate the INDF in order to know if the set of materials

could be considered as learning materials to try to approach actual TSU students´ needs. Hence; Jonson and Jonson (1998) declare that "evaluation or judgment requires the completion of the checklist proper and the writing of comments and suggestions for improvements" (p.121). For this reason, the questionnaire included four sections considering general aspects of INDF. These sections included content, technical vocabulary in context, the practice of the four skills and the usefulness of the INDF to perform oral presentations. One of the main reasons for using the INDF was to match problem-solving materials to help students use technical vocabulary in context of their specialty and to help them describe working situations of industrial maintenance in English, which is one the students' main needs and wants. As previously mentioned, the specific material to be evaluated is called Industrial Need Detection Format (INDF), (see Appendix A), which contains a set of problems to be solved referring to automation, mechanic systems, pneumatic and mechatronic systems as well. It thus includes situations taken from the local industry with technical vocabulary. The example about conveyor bands was taken in this study, where students had to analyze a problem with the proximity sensor of a conveyor band of the local industry and provide solutions. Adding to it, suggested grammar points from the syllabus were also integrated in INDF to be more organized with the information contained in it.

Another relevant issue to mention is the importance of taking into account the experiences that students went through after having completed their last English course. In terms of materials evaluation, TSU students´ opinions are very important because they are the best judges to evaluate the material value and effectiveness to develop their language skills in the classroom. As Tomlinson (2003) declares that "an evaluation focuses on the users of the materials and make judgments about their effectiveness" (p.16).

In order to provide some background to this case study, there are some aspects to consider. Firstly, *UTs* work on intensive courses in which they must acquire English language competence as well as subject matters of their specialty in two years and a half. This means that all courses including English language classes are taught in five quarters and students only have two English classes per week, in two hour sessions. In

this case, the time factor represents a major limitation to teach and learn English so teachers are forced to complete the institutional syllabus to cover the institution´s expectations in a limited period of time.

Secondly, according to the institutional syllabus, English is considered as compulsory and its contents are provided by the *Academia General de Universidades Tecnológicas* in Aguascalientes. These contents are based on grammar and General English without taking into account the students specific needs. Furthermore, those syllabuses are given as the unique guide to English teachers, those can not be modified and must be followed as they are described. Sometimes, preparing a lesson plan with problem-solving material takes extra time to think carefully about the selection of industrial maintenance situations. Therefore, most English teachers prefer to skip it and continue working in a traditional teaching way, omitting materials evaluation processes as well. Chaplen´s (n.d.) opinions (cited in Robinson 1991) calculates that "it takes at least ten hours to prepare an hour ´s worth of teaching material and that developing the first draft" (p. 61).

Finally, another crucial characteristic to mention is that students generally have a low level of English proficiency both when they start and when they finish their studies. According to the Council of Europe (2001) addresses "an outline framework of six broad levels gives an adequate of the learning space relevant to European language learners" (p. 23) and taking into account the language reference classification from the Common European Framework language reference, they are supposed to achieve B1 level. However, they usually remain at A1 level which is not enough to give an opinion about a situation of a machine or to keep a conversation with industrial people whose English is used as means of communication.

1.2 Problem definition

According to my experience, TSU students of Industrial Maintenance school at UTs can not express themselves in English using the adequate vocabulary to describe working situations about Industrial Maintenance at the end of their studies. Therefore, the main aspect English teachers need to consider is "what" to teach and "how" to

teach English related to their specialty subject matters while TSUs are in the school. Apart from this, taking into account students´ low level of English proficiency and the obligatory institutional English syllabus based on grammar emphasizing reading and writing putting aside speaking, listening and vocabulary, it remains a complication to take TSUs to higher English proficiency level. Another restriction for TSU students to speak is teachers´ limited experience about industrial working situations. This actual situation represents a major challenge for English teachers at UTs to assume since it would imply to go beyond traditional teaching style. In many cases, English teachers lack knowledge about other learning and teaching materials; for instance, problem-solving materials related to English specific purposes (ESP), Robinson (1991) comments on "the use of study cases is a well-established method for conducting future professionals into the job demands of business, medicine, the law and engineering" (p.50). On the other hand, English teachers might also ignore the great value of materials evaluation in daily classes, Dickins & Germaine (1992) define that Evaluation "can provide a wealth of information to use for the future direction of the classroom practice, for planning of courses, and for the management of learning tasks and students" (p.3) and this activity should be considered as part of teaching practice.

1.3 General Objective

The main general objective of this study is to evaluate problem-solving materials, specially the INDF designed by the researcher, which includes working situations from the local industry with vocabulary about conveyor bands and other subject matters in general. The INDF was designed taking into account student´s low level of English and the syllabus of fifth quarter and emphasized on reading, writing and speaking as much as possible. Grammar and vocabulary of industrial maintenance were also taken into consideration.

1.4 Justification

This paper intends to contribute with accurate data showing the examination of materials; keeping in mind, TSU students´ needs and opinions. These will serve to get

actual outcomes that will be used to test the authenticity, validity and content of problem-solving materials.

As social contribution, this study could also help English teachers to be aware of the relevance of including; firstly, materials evaluation in language classroom and secondly, to consider problem-solving materials as a learning- teaching material. Thirdly, this investigation might encourage English teachers to assume a new challenge to become more innovative in English teaching classrooms and to try to cover TSU students´ specific needs and help them be more competitive in the outside world and in their work environment. Hyland (2006) claims that "designing new materials can be extremely satisfying; both professionally and creatively, as well as offering students a more tailored learning experience" (p. 96).

1.5 Research Question

In order to deal with the problem outlined above, this paper addresses the following research question:

> How did the Industrial Need Detection Format help students improve their English for Specific Purposes (ESP) skills in Universidades Tecnológicas (UTs)?

The next chapter will review the theoretical foundations upon which this study will be described in detail.

CHAPTER II: LITERATURE REVIEW

This section will attempt to explain the theoretical concepts about materials evaluation philosophy necessary to support the main goal of this paper, considering students´ opinions to evaluate the effectiveness of the INDF with problem-solving cases about Industrial Maintenance subjects. Following this, some authors´ different perspectives about English for Specific Purposes (ESP) principles will be described too since it has a wide branch of theory and practice engaged mainly in learners´ needs, Belcher (2009) states that ESP focuses on "specific-learners-centered language instruction" (p.2) which is the starting point of this study. This discipline involves concepts such as target situation, needs analysis, selection of ESP materials and teacher´s role essential to examine learner´s needs in order to find alternatives to try to cover their language expectations in specialty fields. Last topic is related to problem-solving cases and different concepts will provide specific definitions to build a suitable perception of the benefits and applications in language classrooms and how it could help students develop critical and reasoning thinking skills to face better industrial working situations; emphasizing this statement, Duch (2007) claims that "future professional will be expected to solve, will cross disciplinary boundaries, and will demand innovative approaches and complex problem-solving skills" (p.4) in order to become highly competitive as problem solver dealing with industrial working situations.

2.1 Materials Evaluation

2.1.1 Material evaluation overview

The first aim here is to define the term of materials. Hyland (2006) points out that "materials refer to anything that can help to facilitate the learning of language" (p.94) and evaluation is defined by Dudley-Evans and St. John (1998) who claim that "evaluation involves making judgments which means that we must have criteria for comparative processes" (p.128). Another definition is given by Dickins and Germaine (1992) state that "evaluation is an intrinsic part of teaching and learning" (p.3) since it

provides wealthy information to use for future direction of the classroom practice and planning. Evaluation is not a fact to make judgments about what is good or bad, but it refers to find a systematic way of how something can be improved. According to this author, it is also important "to make explicit the criteria used in our judgments" (p.4); then it is necessary to establish " guiding principles using carefully defined criteria" p.5; for decision making. To support the last statement, Ramsden´s (1996) viewpoint (described in Moore, 2003) declares that evaluation "enables us to make judgments on specific teaching sessions, but also draws out wider implications". And this activity concerns directly to English teacher as a part of the teaching-learning process; then, Hyland (2006) states that "teacher needs to be able to evaluate, adapt and produce suitable and effective materials" (p.96). Moreover, English teachers involved in ESP practice necessary need to produce or adapt materials based on learners´ need not as the teacher´s intuition. Materials evaluation thus enables ESP teachers in material selection following a systematic procedure for making possible modifications systematically; Moore (2003) states that materials evaluation "it is often thought as a systematic process and evaluate the effectiveness of outcomes of a project or system" that includes mainly criteria evaluation, checklist and feedback, considering students´ opinions to examine the effectiveness, accountability, validity and meaningfulness of materials order to elicit specific data to fed back and make suitable decisions with the purpose of improving input material.

Taking into account those different perspectives about materials evaluation definition, it can be said that it is a systematic process that must be an integral part of English teachers´ teaching activity, and they can learn on systematic reflections to enable them to make appropriate modifications with suitable adjustments along their teaching-learning practice as well as it should be participatory considering students´ opinions at all moment. To add more information to this point of view, Jordan (1997) proclaims that "materials evaluation is one part of a complex process and that materials once selected can only be judged successful after classroom implementation and feedback" (p.138); even though feedback is not a subject considered to develop in deep, it is just mention as an important part of materials evaluation process.

2.1.2 Purposes of evaluation

The purpose of evaluation mainly refers to measure the theoretical value and representative content of the materials, Moore (2003) considers that "if the goal is to improve our practice as teachers, then evaluation is an important component of our professional practice as teacher". Adding to it, Dickins and Germaine (1992) state that "Evaluation may be undertaken for three principal reasons: accountability, curriculum development and betterment, self-development: teachers and other language teaching professionals" (p.23). Purpose of accountability refers to something is to continue or to be discontinued; then, curriculum development and betterment lay on specifically to the teacher´s role, Stenhouse (1975) and Harlen´ (1973) opinions (quoted in Dickins and Germaine, 1992) state that" it is the teacher, rather than the tester or the evaluation expert, who has more information about specific classroom contexts" (p.25). In order to describe self-development, Dickins and Germaine (1992) claim that "teachers are involved in describing and better understanding their own context with view to improve the teaching and learning process" (p.25). On the other hand, another purpose of materials evaluation is consider other aspects about what to evaluate in classroom materials, for instance, Moore´s (1980) template (cited in Robinson, 1991) considers that "purpose (clear), exercise type (effective), content (suit ratio of language), interest (learners), authenticity (meaningful), difficulty (distractions)" (p.61); thus, this checklist can help to provide highlight information about the content validity of materials when evaluation is carried out in a systematic procedure. Materials evaluation principles are relevant to remind English teachers that evaluation is a dynamic and systematic process that takes into account all language teaching aspects along the materials evaluation process in order to measure the value and effectiveness of selected materials. According to Tomlinson (2003) states that evaluation is "a procedure that involves measuring the value (or potential value) of a set of materials" (p.15); after knowing the value of teaching-learning materials, English teachers thus are capable to act and make adequate

modifications based on objective reflections generated by data information of materials evaluation process.

2.1.3 Process of Evaluation

This paragraph refers to the process of materials evaluation which is vital to have in mind; especially the different phases of evaluation, to become more precise at the time to analyze each stage for decision making. As follows, Breen ´s (1989) proposal (cited in Dickins and Germaine, 1992) declares that "there are three phases of materials evaluation: material-as-work plan (designing materials), materials as-in-process (material use) and outcomes from materials (learners´ achievements), this alternative provides value information to examine and analyze systematically materials evaluation in order to make objective decisions based on specific data information" (p.30). For the purpose of this paper, this information is relevant because the INDF with problem-solving materials were designed and used as ESP materials as a teaching-learning tool; then, such materials were evaluated by applying a questionnaire to learners to know the effectiveness of the INDF materials. In this fashion, Tomlinson (2003) proclaims that "material developers and teachers need constantly to improve their materials to achieve a closer match with learners´ needs and wants" (p.121). Gathering those author´s perspectives, the process of materials evaluation provides valuable information to evaluate systematically by stages; keeping in mind learners´ specific needs to improve ESP materials constantly along the English course.

2.1.4 Evaluation criteria of materials

Dickins and Germaine (1992) claim that "evaluation criteria should relate not only to the aims and contents of language learning but also, and importantly, to the procedures for work planning with the texts and performing tasks in classroom" (p.34). Evaluation criteria are an essential component of materials evaluation since it should gather the objectives by which evaluation is taking place in a language course. Some questioning should be made in order to define criteria of materials evaluation; Dudley-Evans and St. John (1998) suggest asking one general question: "what are the objectives you are evaluating against?" (p.131). Questions such as this are helpful to concrete which aims

should be considered for the evaluation process. Hence and summarizing Hutchinson and Waters (1987), evaluation criteria refers to evaluate the theoretical value of materials. Likewise, meaningful content, systematic, representative, and appropriate language in relation to student´s needs and language expectations (p.98). In such a way evaluation criteria philosophy determines the objectives of materials evaluation process in relation of examining the value and effectiveness of classroom materials considering specific aspects to know if learning materials is meaningful and functional for learners.

On the other hand, questionnaires are part of evaluation criteria, Moore (2003) says that "there are standard questionnaires that can be used and it is relatively easy to design your own questionnaire". Mackay (1978), Richterich and Chancerel (1980), Smith´s (1989) point of view (mentioned in Robinson, 1991) declare that "the construction and design of questionnaire is a task that is not easy handle (p.70). Hence, it would be vital to follow some advice when it comes to build a questionnaire due to its complexity. According to those authors´ opinions, evaluation criteria is used to evaluate input material by using questionnaires to get specific outcomes, including specific statements that will allow to create suitable criteria to lead adequately the process of materials evaluation.

2.1.5 Checklist of materials evaluation

Another relevant part of materials evaluation is the design of a checklist to establish a guide for evaluation criteria in order to examine the effectiveness and value of materials in content, language length and design. Robison (1991) states that "checklist is much shorter that a questionnaire and can be used when evaluation is focused on small-scale aspects of a programme" (p.70). For instance, Cunningworth´s (1984) example (cited in Dickins and Germaine, 1992) describes "a checklist of evaluation criteria exemplify a checklist for materials evaluation" (p.30), summarizing this author, checklist includes components about how the structures are presented and what extend is the presentation in relation to meaningful (in context), systematic, representative, appropriate to the given context, relevant for learners´ needs, as well as practice activities referring to adequate number, varied, meaningful, appropriate to the given context, relevant and

sufficiently controlled (p.30). Dickins and Germaine (1992) state that "when we analyze classroom materials in this way, we are evaluating the theoretical value, or the construct validity, of a set of materials" (p.30). Another perspective to support the use of checklist is given by OALCF (2011) describes that "the learning materials evaluation tool provides practitioners with standards for assessing learning materials". This article cites an example of the checklist steps and it should evaluate: content and quality of content also potential effectiveness as a teaching-learning tool, ease of use (for practitioners and learners) as well as comments (learners´ comments); besides it must include a ranking to score participants´ outputs (low or high). Thus, the examples above grant significant information about building a checklist for materials evaluation and those concepts are useful to create checklist proper to the objectives of materials evaluation.

2.1.6 Feedback and learners´ opinion in materials evaluation

In this particular case, feedback is mentioned to highlight its importance in the materials evaluation process but not as a main part to be developed in detail along this project. For this, a general overview of Feedback is given by Moore (2003), who claims that feedback "allows us to modify our inputs (theory, context and practice) in order to achieve closer alignment with the outcomes"; this concept is taken to determine what was desired and what was achieved after having done materials evaluation. Moreover; feedback depends on outcomes data derived from learners´ opinions to evaluate materials outputs that will be useful as a source for the basis of inputs of learning materials. After this, feedback helps to identify which changes might usefully improve the outcomes generated from the criteria and checklist used in materials evaluation. Additionally; it is essential to mention that feedback is an activity that must be done constantly along English classes; then, Hyland (2006) states that "it is also an everyday classroom practice, as teachers continually make judgements about the progress" (p.99). Feedback is essential and highly important element that being as a vital part of materials evaluation process contributes with value information to modify input materials adequately to match with students´ needs as possible.

In the notion of the authors´ opinions above, it can be summed up that, materials evaluation must be part of English teachers´ daily classroom activities and it follows a systematic procedure to examine outcomes from learners´ opinions by using questionnaires based on specific criteria guided by a checklist; so that, to be able to get objective data for suitable modification in input materials used as teaching-learning tool. Dudley Evans and St. John (1998) state that "evaluation is asking questions and acting on the response" (p.128); then acting on the response might imply to fed back of the output materials and to adapt the new modifications to the students´ needs as well as their language expectations. In this way, materials evaluation will help to improve classroom materials by acting in a systematic and objective manner.

2.2 English for Specific Purposes (ESP)

For the goal of this paper, English for Specific Purposes (ESP) will be considered to explain the manner of language teaching methodology deals with learner´s specific needs for occupational purposes, in this particular case with students that go directly to the industry after finishing their studies. It is known that ESP is a branch of language teaching that counts on specific procedures that pay attention specifically determining the basis for ESP classrooms. Therefore and in terms of methodology, ESP offers an approach centered on learners´ specific needs, Belcher (2009) states that ESP focuses on "specific learners-centered language instruction" (p.2) and it concerns on defining target situation as well as needs analysis which are necessary to determined specific parameters that will serve as teachers´ guide for planning lesson plans and designing materials in regard to specialty subject matters.

Another fact of ESP to study in this paper is English teacher´s role that represents a meaningful challenge to become successful ESP instructors. On the other hand, ESP materials are imperative to reflect on the selection and design because this practice is part of the ESP teacher to think of new alternatives to adapt new learning materials that covers learner´s specific needs in a communicative way. ESP also lays on language use in terms of communication; for this, Hyland (2006) proclaims that "it is concerned with communication rather than language" (p.116).

2.2.1 ESP definition

In regards to the definition of English for Specific Purposes (ESP), ESP is an approach concerned on learner´s needs and attitudes, Hutchinson and Waters (1987) declare that ESP is "a learning centered approach where is important our concern is with language learning not language use" (p.14) and Roger´s point of view (cited in Hutchinson& Waters, 1987) claims that ESP emphasizes "the central importance of the learners and their attitudes to learning" (p.8). Similarly, ESP implies specific methods and materials based on specific learners´ needs; Dudley- Evans and St. John (1998) declare that "ESP teaching does not necessary be related to the content but it should always reflect the underlying concepts and activities on the broad discipline" (p.4). According to this perspective, it is more important to think of activities to engage students to practice the specialty subject matters in context rather than to teach them on language content because ESP learners need to handle the language communicatively to express their ideas orally using technical vocabulary of specific field of work. Such as this, ESP classroom also concerns on training students on specific fields of work specially those belonging to the industry. Robinson (1991) asserts that ESP is an enterprise that involves "education, training and practice, language, pedagogy and students´/participants´ specialist area of interests" (p.1). Hence, to define ESP, Johnson and Johnson (1998) claim that ESP is "a recognizable activity within the broader professional framework of English language teaching, with implications for design of syllabuses and materials as well as for the implication of areas of research" (p.105). In the author ´s experience, ESP definition is a learning approach centered in learners´ need to design suitable and effective syllabus and materials using specific methods to accomplish specific purpose of the language that help to develop ESP skills to learners dedicated to work at the industry.

2.2.2 Target Situation Analysis (TSA)

Before embarking to the design of ESP course, syllabus and materials, it is decisive to start identifying target situation. Essentially, target situation is one part of needs analysis

to collect value information that helps English teacher delimit student´ specific needs, wants and desires of the ESP course, by which it is necessary to find out carefully learners´ specific needs. In this notion, Hutchinson and Waters (1987) declare that target situation is "to take the existing knowledge and set it on more scientific basis, establishing procedures for relating language analysis closely to learner´s reasons for learning" (p.12). Complementing this last statement, Dudley-Evans and St. John (1998) say that "it is what learners already know, a present situation analysis (PSA) from which we can deduce their lacks, strengths and weaknesses in language, skills, learning experience" (p.124). Thus, the target situation analysis contributes to the definition of learners´ needs, lacks and wants from their present situation in a systematic way. To support the last statement, PSA is also considered as an approach for course design where it is important to make clear learner´s needs using specific techniques to data collection. For this, Jordan (1997) state that "the PSA ascertains the students state of language development at the beginning of the language course" (p.24) and the source of information are students place of work or sponsoring body by sing questionnaires and interviews. In such a way, Robinson (1991) states that "PSA seeks to establish what the students are like at the start of their language course, investigating their strengths and weakness" (p.9) and to add more information to this definition, it is also important to take into account students´ proficiency level, Belcher (2009) claims that " language instructors attempts to address learners´ present needs having gauged proficiency levels" (p.3). For this reason, the target situation analysis states the specific learners´ needs from PSA identifying their lacks and strengths by formulating questions for learners carrying out their proficiency level before thinking to plan ESP course and syllabus or to design materials.

2.2.3 Needs Analysis

After having stated the target situation, the next step is to make needs analysis in which all learners´ needs are integrated to determine ESP basis in order to start a course. Firstly, it is crucial to define the term needs, as in Widdowson ´s (1981) view (pointed out Robinson, 1991) defines that "needs can refer to students´ study or job

requirements" (p.7); to complement this concept, Dudley-Evans and St John (1998) suggest that "it is also the corner stone of ESP and leads to a very focused course" (p.122). Thus, need is understood as specific necessities of the language required including labor working situations. On the other hand, Huckin´s (1988) opinion (cited in Jordan, 1997) proclaims that "needs analysis should be the starting point devising syllabuses, courses, materials and the kind of teaching and learning that takes place" (p.22). Emphasizing this concept, Hyland (2006) declares that needs analysis is an "umbrella terms that embraces many aspects, incorporating learner´s goals and backgrounds, their language proficiency, their reasons for taking the course, their teaching and learning preferences, and the situations they will need to communicate in" (p.73). For the purpose of this project, the last perception best defines the concept of needs analysis; in this way, needs analysis is a departure point when planning not only a course but also materials design in order to create syllabus, prepare effective material including learning situations based on students´ actual situation considering their necessities, lacks and strengths of the language learning.

The evaluation of the present materials may serve as a teaching-learning tool to develop ESP materials and to carry out a needs analysis in industrial working contexts.

2.2.4 General English teacher turned into ESP teacher

Turning English teachers into ESP teachers implies to succeed in the language domain of the specialty subject matter using specific methodology and to adapt and to design ESP materials as well as to carry out an evaluation to match with learners´ needs constantly. ESP teacher qualities described by Robinson (1991) claims that "one of the prime requisites seems to be flexible and a willingness to try new approaches and methods" (p.96). Undoubtedly, the significant challenge for ESP teachers means to be willing and flexible and to be interested in the students´ needs to cover their specialty subject needs. Belcher (2009) declares that " ESP specialists accept responsibility for finding out what their learners will likely needs, to be able to read , write, speak and comprehend as listeners to achieve their goals" (p.3). ESP teachers must take actions constantly to be informed of new learning working situation as well as ESP adjustments

to cover students´ needs as much as possible. There are some specific activities that the ESP practitioner should develop. Dudley-Evans and St. John´ s (1998) viewpoint (mentioned in Gatehouse, 2007) claim that there are "five keys roles of for the ESP practitioner: teacher, course designer and materials provider, collaborator, researcher and evaluator".

On the other hand, ESP teachers only need to get informed about relevant material recommended by experienced colleagues and students as well just to understand basic concepts and viewpoints of the specialty area of study but Robinson (1991) claims that an ESP practitioner "requires a large direct input of teaching" (p.4). In the light of training, ESP teachers, Dudley-Evans and St. John (1998) consider that "the final level of subject-language integration is the actual working together in the classroom of the subject and language specialist" (p.45) in order to have assistance and feedback helps to train ESP teacher in team teaching. Thus, ESP teachers requires not only being fluent in English language but to achieve credibility as a professional instructor of specialty subject, analysis of training needs, counseling, feedback skills and cost effective training planning based on learner´s needs.

2.2.5. Selection of ESP materials

In terms of ESP materials, Hyland (2006) states that "materials are the interface between teaching and learning "(p.89); the use of materials in ESP classroom is essential to introduce or to reinforce topics belonging to specialty field of study. ESP materials provide a source of learning from real life events; in this case, industrial working situations that become benefic information to ESP students to analyze labor working cases since they are in class. Paraphrasing Ellis and Johnson (1994) about materials use, they suggest that one of the qualities of good materials is authenticity and it must refer to real world; for instance, texts, visual, or audio material, realia like tickets, menus, maps, and timetables, objects, such as products, equipment, components or models, manual of a software or instructional of a maintenance equipment. Accordingly, Belcher (2009) agrees that "ESP materials have clear advantages in terms of authenticity and specificity using commercial materials" (p.8). Using authentic materials, ESP students can face to

industrial working situations and discover thinking strategies that might enable them to analyze adequately to solve any industrial working situation.

On the other hand, Hutchinson and Waters (1987) declare that "good material do not teach: they encourage learners to learn" (p.107). Thus, representative and meaningful materials seek to impact students and ESP teachers must be careful about matching learners´ needs with ESP materials frequently to keep learners´ interested in developing their ESP skills along the course.

In short, ESP is a learner-centered-approach that is concerned with specific student´s needs immersed in specialty subject matter identifying learners´ present situation (PSA) that makes a suit needs analysis to determine the ESP basis for syllabus and course design as well as adapting or creating ESP materials to cover students´ specific needs. Referring to, the challenge of the ESP teacher is crucial to be aware of ESP principles to know procedures that allow to new ESP teachers to be willing and flexible to become a student and instructor in order to learn new language approaches as well as specialty subject matters to succeed in ESP course. Besides, being interested in reading, adapting and even creating home-materials, dedicating energy and time consuming with the unique intention to get students interested and undoubtedly, to train them in their future jobs since their school stay.

2.3 Problem- solving overview

In this section, different perspectives about problem-solving cases will be described and all of those will contribute to a suitable definition about this topic since the materials evaluated in this project are based on problem-solving materials. To cite a definition of this teaching-learning strategy, Soden (1994) states that problem-solving involves "an instructional approach which targets both the learning of information and its applications " (p.23). Problem-solving also involves mental operations that train students to learn to think by generating appropriate questions by themselves. In this mental process, students are left to try and discover their rational thinking of mental operation for a task. Referring to mental procedures, it concerns about decision making, organizing, prioritizing and planning before acting. So, this perspective clarifies that

problem-solving is an approach that enables learners to use their capacity of processing the information and increase students´ repertoire of mental operations useful to solve problems adequately in labor working situations. This point of view is important because students that go directly to the enterprise after graduation need to become good decision makers as well as good problem solvers. According to this author, problem-solving skills are thinking skills that help students use their knowledge in a flexible and adaptable way in solving problem by using problem-solving cases in classrooms. Moreover, using problem-solving cases help students develop communicative skills in context as it is cited in Master and Brinton (1998) asset that " it suggests ways to use case studies to help business English students acquire professional communicative competence" (p.155), this is one of the goals of problem-solving strategies, to develop communicative skills while students are reasoning problem-solving materials in ESP classrooms.

Another opinion is suggested by Baiocco (1998), who considers that "problem-solving processes shape students into autonomous learners" (p.170); with the use of this strategy, students can see and gather and interpret a problem; then, value and make a plan; as well as to build, do and check the alternatives to solve an industrial working situation. Generally, students who work at industry are required to be autonomous and efficient to solve problems when it is needed. Students must be able to become autonomous to solve problem independently but highly competitive as working with other colleagues in specific situations at the industry. Adding to it, Lesh and Doerr (2003) claim that "solutions typically involves several modeling cycles and predictions are gradually refined and elaborated" (p.31); this means to train students in objective predictions using their previous experience about the problem and add new strategies to improve students´ interpretation when they face to a challenging situation analyzing problem-solving cases in class and at the industry as well. In fact, a problem-solving approach also is considered to train students in teaching excellence. This concept is defined by Heller & Hollabaugh (1992) and Mazur (1996) opinion (cited in Duch, 2007) declare that "develop material with effective problem-solving and analytical skill develop critical thinking skills and logical reasoning" (p.48). Those qualities are

necessary for ESP students to be developed during their school years; due to, they need to act adequately when they are asked to solve or make suggestions to a problem at the enterprise. On the other hand, it is also important to have students practice with real working situation so they can develop mental operations that will enable them with reasoning thinking to solve problem since they are at school. To emphasize last statement Lesh and Doerr (2003) claim that "we can put students in situations where they struggle with cases that reflect the real world" (p.242) so that, students might learn to reflect critically and develop reasoning thinking skills that enable them to be better prepared to solve problems in their future jobs.

Concluding this chapter, and based on the purpose of this project, materials evaluation, all those theoretical concepts have been described with the intention of finding out supporting ideas that explain the different assumptions about the materials evaluation of the INDF with problem-solving cases. ESP principles were essential to define learners´ specific needs where the materials evaluation is carrying out along this paper.

CHAPTER III: METHODOLOGY

In this section, I will describe the design of this study divided into four main sections as follows: setting, subjects, instruments and the procedure that provided the means for the data analysis in chapter four. In the matter of selecting a model to get data collection, qualitative method was considered for the validity and reliability of the research question handled in this paper, in order to know participants´ opinions about how the Industrial Needs Detection Format (INDF) helped students improve their ESP in Universidades Tecnológicas (UTs). For instance; Silverman (2005) states that "if you want to discover how people intend to vote, then a qualitative method, like social survey, may be the most appropriate choice" (p.6). Therefore, this study was guided with qualitative model and took into account some aspects of quantitative method at the moment to use some graphics and tables to number participants´ opinions for each item of the questionnaire in order to get general references of the data collection and make objective conclusions from the final results.

3.1 Setting

This research was carried out in the Universidad Tecnológica Tula- Tepeji, a public university in Hidalgo, Pachuca. The decision to handle this project was made since as an English teacher assigned to teach English language in Industrial Maintenance program gave me the opportunity to collect the required data from a place that I was acquainted with the teaching languages process along 10 years. The main role as English teacher was to combine grammar points with the problem-solving cases described in the INDF, also to provide examples about working situations, in order to instruct TSU students to be familiar with the INDF. Then, to help them improve students´ writing style by reviewing orthography, syntax, coherence that helped students develop their language skills, specially writing, reading and speaking in a minimal part.

Due to the fact that TSU students required to direct official letters to be assigned them specific enterprises, it was necessary to lead their final projects by calling or sending e-mails and keeping in touch with industrial people with whom students worked on specific working situations at the assigned enterprise.

Talking about the creation of the INDF and after having informal talks to subject-matter teachers about the way TSU students needed to be trained to solve a situation at the industry; Duch (2007) claims that " an occasional coffee break or lunch with others using PBL can help deal with new situations"(p.70); it was thought of designing a format where TSU students should describe briefly a working situation including: a description of specific case, to provide information about the problem, help them think as in cause and effect way; Lesh & Doerr (2003) state that " solutions typically involves several modeling cycles and predictions are gradually refined and elaborated " (p.37). Next, previous experience was considered in order to elicit ideas from students' previous experience in their working area. Then, a strategywas developed in which students had to write a checklist to solve the problem including additional information from an operational manual or other source of information; Lesh & Doerr (2003) say that " problem-solving activities that we refer to as model-eliciting activities" (p.3). Finally, research, sources of a manual links, websites and additional information and to complement their previous experience to solve the problem. Giovioli´s (2005) opinion (quoted in Belcher, 2009) states that "bank of English with samples of written and spoken English represents a huge range of resources; including newspapers, text books, websites, television and radio broadcasts, meetings and conversations" (p.4). Those English banks are also kind of corpus tools, Lee and Swales´ (2006) view point (cited in Belcher, 2009) claim that "such tools have the added benefit of empowering learners to determine their own target needs, or goals" (p.5). Besides this, it can be considered that the INDF could be part of corpus tools to help students develop ESP skills for their future professions. All these points were taken into account in order to develop the INDF.

Before the actual INDF design, a set of problem-solving sample cases such as conveyor bands, total productive maintenance, pneumatic, mechanic and automation

systems were suggested to the English teacher by the subject-matter teachers; Duch (2007) states that "colleagues from diverse disciplines can contribute constructively to teach other´s effective teaching" (p.70). Another source of information was visiting enterprises of the local industry as a commissioning teacher to take TSU students to know the production process and to interview industrial people in order to get information about common working situations that could be used in the English classroom with academic purposes. Aside from this, interviewing orally pre-experienced students that worked and studied simultaneously contributed to enrich problem- solving cases that resulted in the design of the INDF.

On the other hand, a relevant issue here is participants´ proficiency English level. According to the Common European Framework of Reference for Languages (CEFR), TSU students could be ranked in A level, that is formulaic proficiency and introductory as in Wilkins and Trim ´s (1978) proposal (quoted in Council of Europe, 2001) which describes that A language proficiency level belongs to "basic users" from A1 to A2 and defined as 'waystay' and 'vantage' respectively. In this introductory stage, A1 students can understand familiar expression, introduce themselves, interact in a simple way, talk slowly and prepared to help. Similarly, A2 students can understand basic information about employment, communicate in simple routines, can describe simple aspects of immediate basic need (p. 24). In this particular TSU students handle the INDF materials with some difficulties because of their language limitations that made much more complicated when it comes to introduce problem-solving materials during the English class.

3.2 Participants

Approximately, 80 TSU students from mechatronics systems and maintenance program participated to create problem-solving cases showed in the INDF from 2011 and 2013. However, for this study, the last 28 students´ opinions from fifth quarter of TSU from Industrial Maintenance program were taken because of time limitations. From those 28 TSU students, two of the participants were female and twenty-six were male and were given the questionnaire on the last day of their course because of time

limitations since students were busy to complete other projects from their specialty-subject matters.

3.3 Data collection Instrument

In regards to qualitative method, the instrument applied to gather data was a questionnaire where participants were asked to evaluate the INDF materials (See Appendix B). The questionnaire included Yes/ No items and it was divided into four sections for the materials evaluation as follows: practice of technical vocabulary, practice of language skills, functionality of INDF and problem-solving cases, oral presentation performance and INDF as a language teaching tool.

3.4 Analysis Procedure

After finishing their specialty-subject projects, on the last day of the course, TSU students were asked to answer the questionnaire to evaluate the validity and functionality of the INDF (Appendix A) with problem-solving cases used in the classroom as a part of their language English learning. Briefly, it must be stressed that the INDF involved team work, problem-solving discussions, research, oral presentations, and a final project.

The results of the questionnaire analysis are presented in the next chapter.

CHAPTER IV: FINDINGS

This chapter will provide a broad explanation about data collection of materials evaluation picked up in the previous chapter. As previously mentioned, a questionnaire was applied to TSU students to evaluate effectiveness of the INDF with the problem-solving cases and TSU students´ opinions were highly valuable to obtain the required data to analyze the final results and to draw some conclusions that will allow to answer the research question posed this paper.

As mentioned in chapter three, the design of the instrument to evaluate the INDF was divided into four parts where the most important parameters to validate different aspects of the INDF with problem-solving materials were considered. For this, section one evaluates TSU students´ experience to practice technical vocabulary of Industrial Maintenance in the INDF to suggest a solution for problem-solving cases. Secondly, part two examines TSU students´ opinions when they practiced the four skills in the INDF and if it was helpful to improve their skills using problem-solving materials when they practiced in role-plays and oral presentation exercises to gain labor experience for their future jobs. The third aspect was to evaluate when TSU students had their oral presentations taking as a main reference the INDF with problem-solving materials pointing out time limitations, the kind of exercise to practice speaking in order to be well prepared to have their final oral presentations and self-evaluation about their own problem-solving case projects. The last fact to address was the possibility to consider the INDF with problem-solving materials as an Industrial repository proposed as a teaching tool and taken into account TSU students´ problem-solving projects as a part of the Industrial repository to share with future TSU students to be applied this industrial repository as learning materials to consult their samples of problem-solving cases.

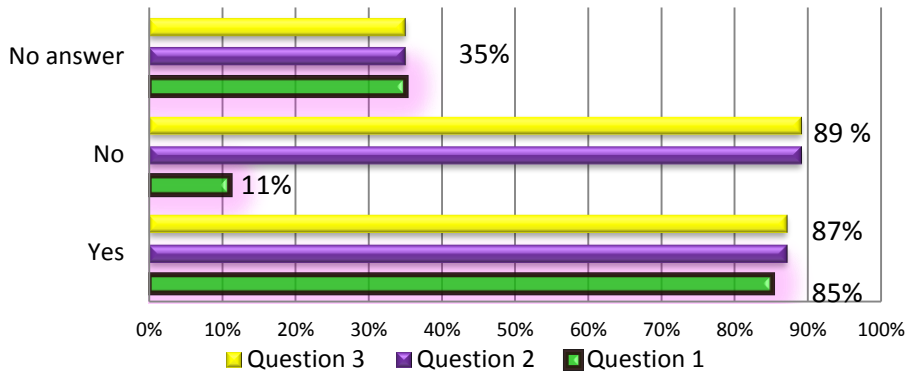
Finally, the results will be presented in the following way, each part of the questionnaire will be described in detail supported by tables and graphs to show TSU

students´ opinions to make suitable comments about the final result from data collection.

4.1 Section 1. Practice of Technical Vocabulary

In this part of the chapter, questions one, two and three where STU students evaluated the INDF materials in relation to the effectiveness of the INDF physical design when they were describing in English problem-solving cases. According to the percentages, the majority of the TSU students answered affirmatively. By contrast; just a small percentage showed negative answers. Figure 1 below shows these percentages.

Figure 1.TSU students´ opinions of Technical Vocabulary practice



The results above show that 89 % of students practiced technical vocabulary in the INDF when they were analyzing problem-solving cases about Industrial Maintenance area as well as filling the INDF with the problem-solving case. They also considered they had practiced technical vocabulary and suggested a solution to the problem-solving case during class. However, it is important to consider the 35% about negative answers since it could help to make future modifications, as materials evaluation enable examiners for systematic reflections to make appropriate modifications. So that it was the importance to consider the data from graphs to determine possible changes in the INDF.

4.2. Section 2. Industrial Needs Detection Format evaluation in terms of Language Skills development

This section will ponder three parameters of the INDF to evaluate effectiveness as improving language skills and expressing TSU students´ ideas in front of the group by means of practicing role-plays in class, to train them for oral individual presentations in order to gain some labor experience for your future jobs.

Derived from the nature of the questions from four to seven, it can be seen from the media that the INDF helped TSU students practice language skills. Referring to Reading and Speaking skills twenty-six TSU students said "Yes". Listening was about twenty-five TSU students agreed "Yes". Finally, it can be exhibited that writing skill was the most practiced by them. In general most of the TSU students could improve their language skill using the INDF with problem-solving materials, emphasizing on writing skill. In contrast with it, two students answered "No" and only one from the total amount of students did not answer questions for unknown reasons. This data analysis can be seen in Table 1.

Table 1.INDF with the practice of Language Skills

Language Skills	TSU students answered YES	TSU students answered NO	TSU students did not answer
Q4. Listening	25	2	1
Q5. Reading	26	2	1
Q6. Writing	27	1	0
Language skill media	26	2	1
Language skill Media	26	2	1

On the other hand, TSU students were asked to rank the language skills pondering with numbers from one as minimal to ten as maximum value to evaluate the INDF with problem-solving materials in relation to practice language skills.

The exhibited results from graphs, taking into account maximum values only, showed that thirteen students graded listening skill pondering with number eight. Less than half agreed that they had practiced this skill; however, it was acceptable for them. So, it can be said that even though listening was practiced according to under half of the group, the ones who said "yes" gave high score to this skill, it seems to be beneficial too for them to improve their language skill. Nevertheless, some decisions must be made to find suitable listening strategies to succeed in the whole group. See figure 1.

Opposite to listening was reading, it was graded with number seven by fifteen TSU students. It can be noticed that more than half of the group considered they had practiced reading in less scale. See figure 2.

Figure 1.Listening

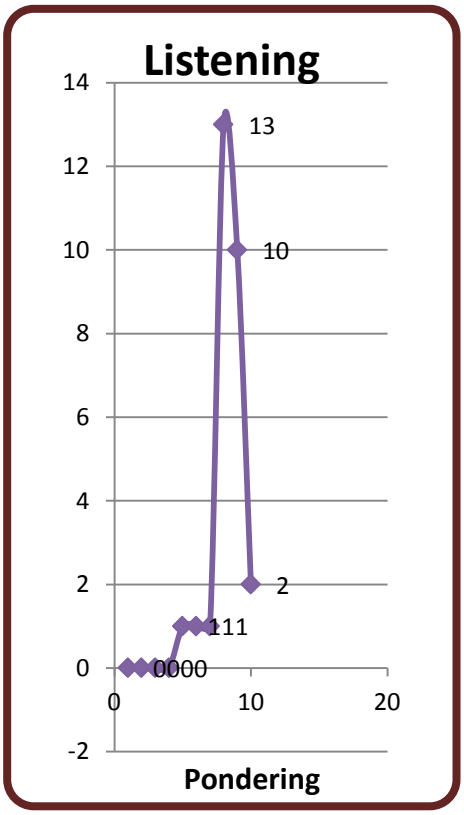
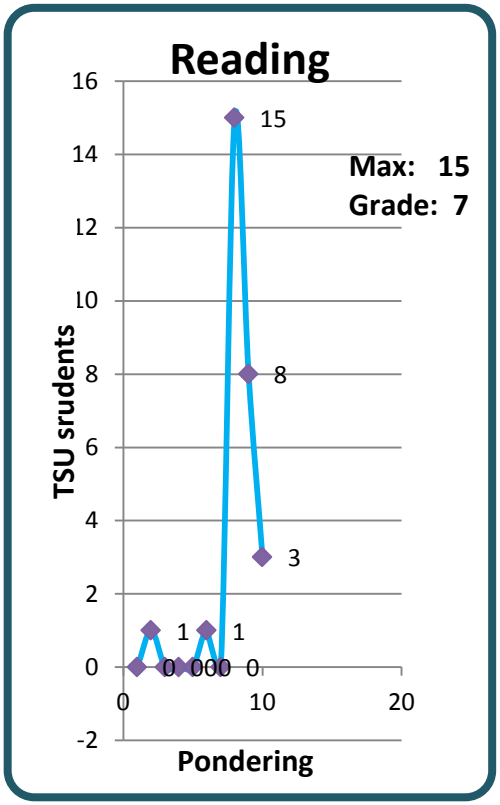


Figure 2.Reading



As mentioned in chapter two and three and one of the reasons that TSU students did not practice reading as they expected is displayed in figure 2. TSU students had low level of

English and in real time they had to search for information like operational manuals to complement their projects. However they felt forced to read because in many cases they got some knowledge to provide a solution to the problem-solving case that they were analyzing in the INDF so they preferred to trust in their previous experience and spend more time on analyzing possible solutions and filling in the INDF or practice dialogues for oral presentations in groups. Then, data in figure 2 demonstrates that TSU students practiced reading but in less intensity. Once again, data analysis is useful to think about different alternatives to help TSU students improve language skill as using the INDF.

With reference to speaking and writing skills both were pondered with number eight but some variations are seen in the graphs. Eleven TSU students answered in favor for speaking and fourteen of them agreed to practice writing skill in the INDF. See figure 3 for speaking and figure 4 for writing data analysis.

Figure 3.Speaking

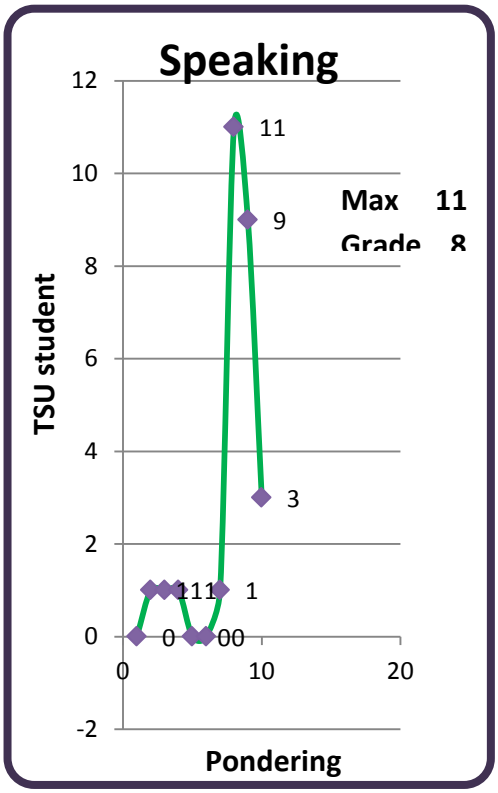
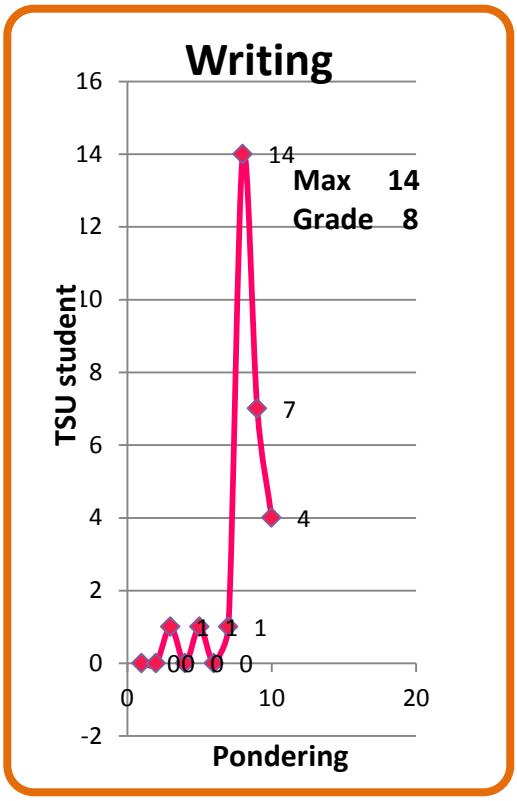


Figure 4.Writing



Although both skills were graded with eight, it can be said that writing was more practiced than speaking over the half of TSU students. Contrasting speaking with other skills, the ones who considered practicing this skill, graded with high score but it was less than half of the total amount of students. Hence, speaking is considered the language skill less practiced by TSU students than the other skills. Then and for writing skill, it is distinguished to be practiced exactly by the half of the group, with high score; it seemed TSU students were interested in practicing writing skill as using the INDF with problem-solving materials.

In general, final results of the evaluation of the INDF in relation of improving language skills derived from different focuses as analyzing language skills in the figures 1, 2, 3 and 4. It can be pointed on final results that language skills were practiced using the INDF. As mentioned in chapter two, the use of problem-solving materials could contribute to develop critical thinking and logical reasoning as practicing language skills to help students to become more autonomous and more competitive in their for their future jobs. Adding to it, problem-solving materials also help to develop ESP skills as dealing with specialty subject matters in language teaching which helps also to support the purpose of materials evaluations of this project.

4.2.1. Section 2. Evaluations of the effectiveness of the Industrial Needs Detection Format (INDF) to improve speaking skills for oral presentation in teams

The second aspect to materials evaluate is the INDF effectiveness to train TSU students to improve speaking skill with problem- solving materials for their final oral presentation in teams. With this in mind, data analysis from questions four to seven will be exposed in table 2 and high scores will be only taken into account for this examination since those results below involved almost the entire group tested in this project and the results derived positive answers.

The first key point to evaluate is the fact to help TSU students express their ideas in front of others; for this effect, twenty-five of them said “yes”. Next, question five

examines the practice of role-play in class so twenty-two confirmed positively their answers indicating this practice could have helped them to train them in oral individual presentations working in teams.

Then, in questions six, twenty-four of total amount of TSU students agreed with the fact that the INDF with problem-solving cases helped them to improve their speaking skills for oral individual presentations. The light for question six was to evaluate that the INDF could also help them enable them with speaking strategies to have individual oral presentation. In real time, TSU students presented a lot of limitations on fluency and pronunciation and grammar structures. However their individual oral speeches were enough comprehensible to let others understand the essence of the specific problem-solving case that they were explaining in front of the class. Despite of speaking limitations, everything was productive because they could express themselves dealing with specialty subject matter using the INDF.

Table 2.Evaluation of effectiveness of the INDF with problem-solving material helped TSU student to develop speaking strategies for oral presentation in teams

	TSU students answered YES	**TSU students answered NO**	**TSU students did not answer**
Q. 4 express ideas	25	3	0
Q. 5 practice role-play in class	22	6	0
Q. 6 train for oral individual presentation	24	3	1
Q. 7 gain some labor experience for future jobs	24	4	0

On the other hand, to point out question seven, twenty-four TSU students answered "yes" the INDF with problem-solving materials helped them to gain some labor experience for their future jobs. This particular part of materials evaluation is highly valuable to answer the research question posed along this project because one of the purposes of INDF content is to enable TSU students to gain labor experience by using problem-solving materials during their school years to train them to develop strategies to solve working situation in their future jobs. Soden (1994) claims that "you will apply mental procedures required in problem-solving most effectively when you learn the information in an organized way" (p 32). Thus the INDF offers a possibility to learn problem-solving materials in an organized way to have TSU students develop both mental procedures and problem- solving skills in working situations since the school stay. Students could be more prepared to provide a solution appropriately to any given task or to provide a responsible and critical opinion when they are asked to solve a problem in the industry when it is required.

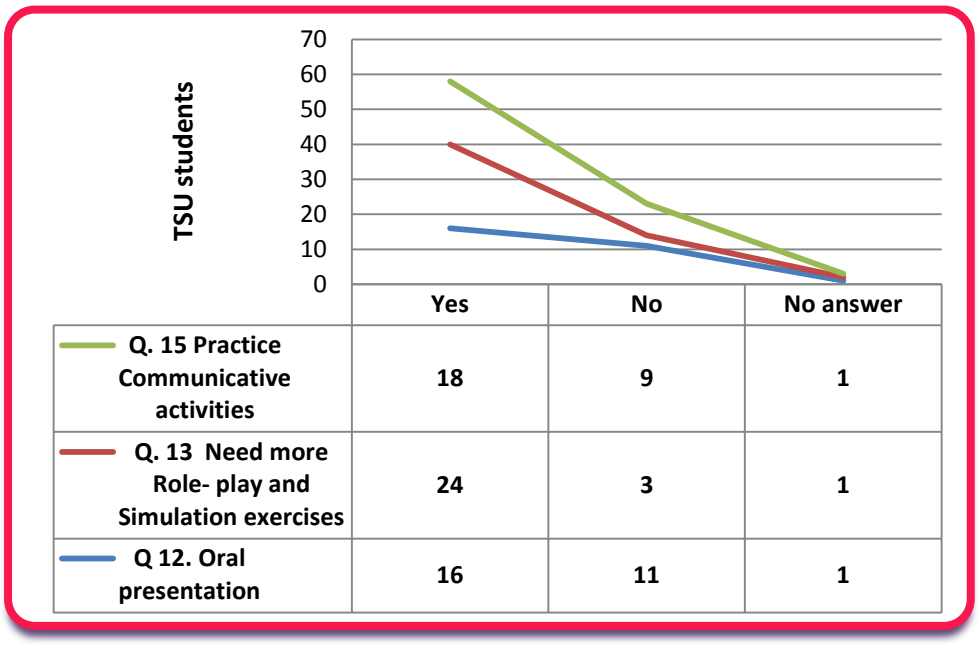
Briefly summarizing data from table 2, speaking strategies like role-play in class also helped to train TSU students for oral presentation in team work using the INDF, in real time the responsibility to express their ideas was shared in the participants of the team and they might be confident to explain the problem-solving cases to other taking roles, like the project manager, expert technician or the supplier. Apart from this, in question seven, TSU students agreed to gain some labor experience for their future jobs by using problem-solving materials.

Data analysis from this section also contributes to the purpose of materials evaluations of the INDF to help TSU students improve language skills as well as emphasizing on listening, writing and in a minimal part speaking as well as reading. However, it presents a balanced way of skill training by using the INDF materials.

4.3. Section 3. Oral Presentation

In this part of the questionnaire, questions from twelve to eighteen will provide valuable results after finishing students' projects using the INDF with problem-solving materials from assigned enterprise. This part will indicate how useful the INDF wasfor oral presentations individually in front of the group. To analyze the final results, questions twelve, thirteen and fifteen will be exhibited in one figure because there are related to TSU students´ individual oral preparation using role-play and simulation exercises as speaking strategy to improve their speaking strategies during class. See data in figure 5 as follows:

Figure 5.TSU students´ oral presentations working in teams using the INDF with TSU students 'problem-solving cases



	Yes	No	No answer
Q. 15 Practice Communicative activities	18	9	1
Q. 13 Need more Role- play and Simulation exercises	24	3	1
Q 12. Oral presentation	16	11	1

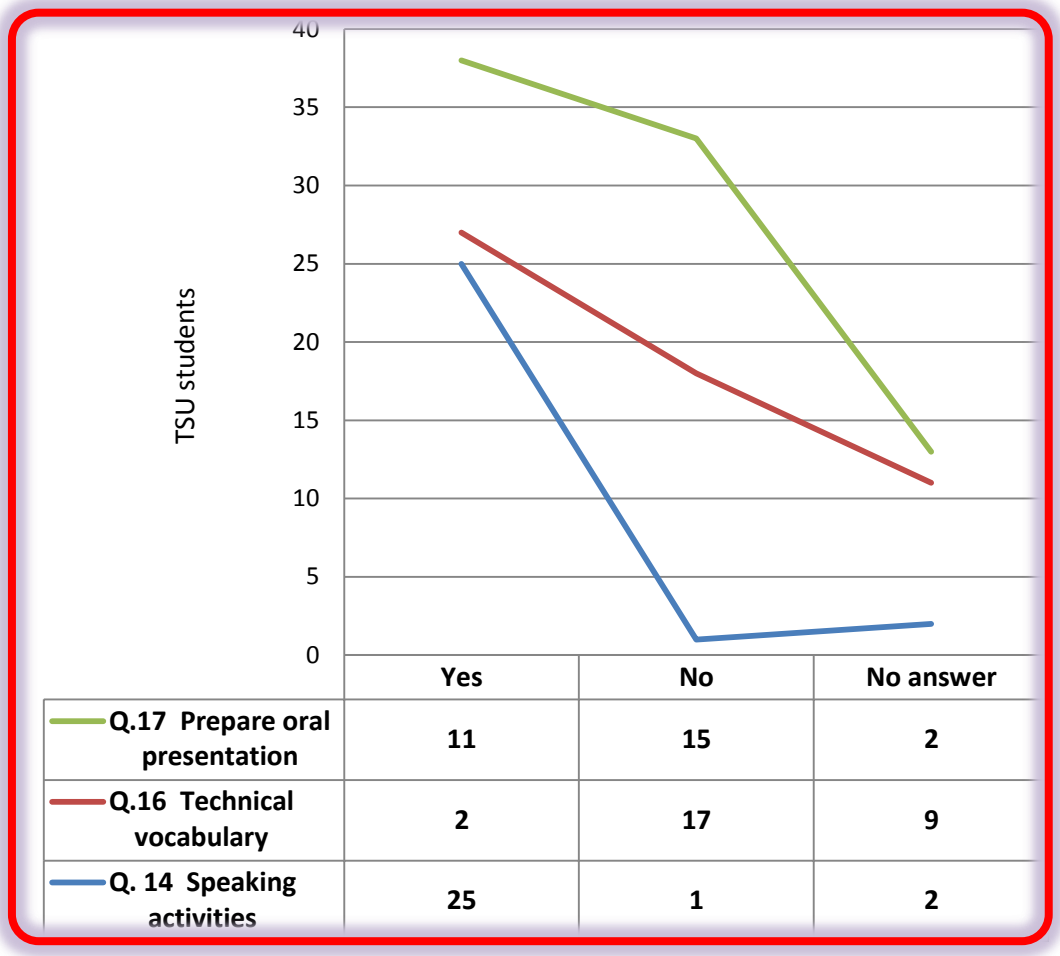
As can be noticed in the figure 5 above, the preparation of TSU student´s oral presentation required to include more exercises as data in question twelve shows. Sixteen TSU students said "yes" and eleven of them said "no" which means a balance in the results. However, considering the question refers to whether they were ready to have an oral presentations, it can be noticed that most of them were ready but the ones who said "no" is an important amount of the group required more help in oral practice.

Equally important, question thirteen presented that twenty-four TSU students needed to practice more role-play and simulations exercises before their oral presentation. Question fifteen displays that the majority of TSU students also required to practice more communicative activities using the INDF with problem-solving cases to be well prepared before their oral presentations. Robinson (1991) mentioned that "ESP course need not to include specialist language and content, what is more important is the activities that students engage in" (p.4) because it is not only the fact to adapt materials with real industrial problems but also the way it is introduced to students to train them to perfume an oral presentation. Briefly, TSU students needed to be engaged in more role-play practice and simulation exercises integrated in communicative activities using the INDF before they present their materials in front of the group.

On the other hand, questions fourteen, sixteen and seventeen introduced interesting data that might explain some of the reasons why TSU students presented limitations in their individual oral presentation.

For this purpose, the content of the questions above evaluated time factor in order to practice communicative activities using technical vocabulary of Industrial Maintenance area as preparation for oral individual presentations in front of the group. Figure 6 shows data about time factor.

Figure 6.TSU students´ opinions about time as a limitation to succeed individual oral presentations



	Yes	No	No answer
Q.17 Prepare oral presentation	11	15	2
Q.16 Technical vocabulary	2	17	9
Q. 14 Speaking activities	25	1	2

Interesting results from the figure 6 were displayed by TSU students´ opinions and those demonstrated that time represented a limitation to practice speaking activities with technical vocabulary in order to be well prepared before their individual oral presentations. In question fourteen, twenty of them agreed time was a limitation to practice speaking activities in class; contrasting with question sixteen, it can be exhibited that seventeen TSU students confirmed that time was also a limitation to practice technical vocabulary, only two of them said " yes", Nevertheless, nine TSU students preferred not to answer this question. Even though it is not a big number of students that skipped the questions sixteen, it is a representative indicator to consider for future modifications in the INDF.

Correspondingly, question seventeen, evaluated the time dedicated to prepare their oral individual presentation using the INDF. Then, fifteen TSU students said "no" which remains more that the half of the total amount students as well as eleven of them said " yes". So final results from this question showed the majority did not have time to prepare their final oral presentations. It can be assumed that TSU students had their individual oral presentation just with the practice acquired by speaking strategies during the class. this could be one of the reasons that TSU students presented lots of speaking limitations during their individual oral presentation after having worked in teams with the INDF on their own problem-solving material from the assigned local enterprise.

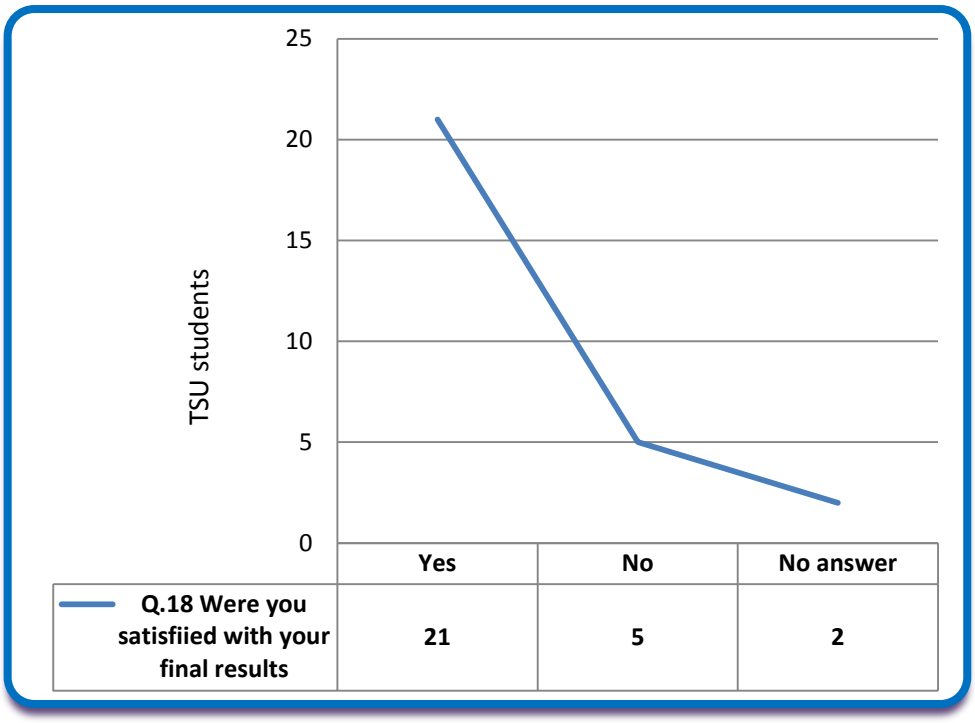
From given data in figure 6, it can be drawn that time represented a limitation to practice speaking activities with technical vocabulary in communicative activities using the INDF, especially in the case of oral individual preparation.

On the other hand, and to complement this part of the INDF evaluation, data from question eighteen displayed another interesting result in regard to TSU students self-evaluation after having worked in teams on their own sample of problem-solving case from assigned local industry using the INDF. This question also considers TSU students´ self-evaluation about their performance working in teams taking the responsibility of different roles to accomplish the team goal. Notably, most of TSU students were satisfied with their performance in general, twenty-one of them answered "yes" and only five of the group replied "no". Two preferred not to answer it. This data analysis can be seen around figure 7.

Around figure 7 above, it can be expressed that most of the TSU students were satisfied with their final results after working in teams when implementing their own problem-solving materials using the INDF for their individual oral presentations, which were taking place at the end of the course. Belcher (2009) said that "PBL students tend to be more satisfied with their educational experience than those in traditional programs"

(p.236) since it is expected to make TSU students develop critical habits of mind that help them to succeed when solving problem.

Figure 7.TSU students' self-evaluation working in teams using the INDF implementing their own problem-solving material



To conclude, section three of the questionnaire, data exhibited in figures five, six and seven evaluated TSU students´ preparation for their individual oral presentations after working in teams including the responsibility of their assigned roles. Moreover, self-evaluation after their oral performance in front of the group considering their personal opinion about the way they felt with their final results. To support the advantages of team work, Duch (2007) claimed that "courses that incorporate small-group learning can have a positive effect on student academic achievement" (p.60). Working in small groups encouraged TSU students to accomplish the goals of the INDF, they felt integrated to work along the project. Moreover, they also participated in

decision making and most of them were responsible for their assigned role. Working in teams was productive in the INDF project.

Regarding this data analysis, it shows that TSU students, from one side, needed more speaking exercises to enable them with suitable strategies; moreover, they argued that time factor was a limitation to be better prepared for their final oral individual presentations. At the same time and despite their lack of speaking preparation including time limitations, TSU students were satisfied with their final results after working in teams using the INDF with problem-solving materials as implementing their own cases from assigned local enterprise.

4.4. Section 4. Industrial Repository

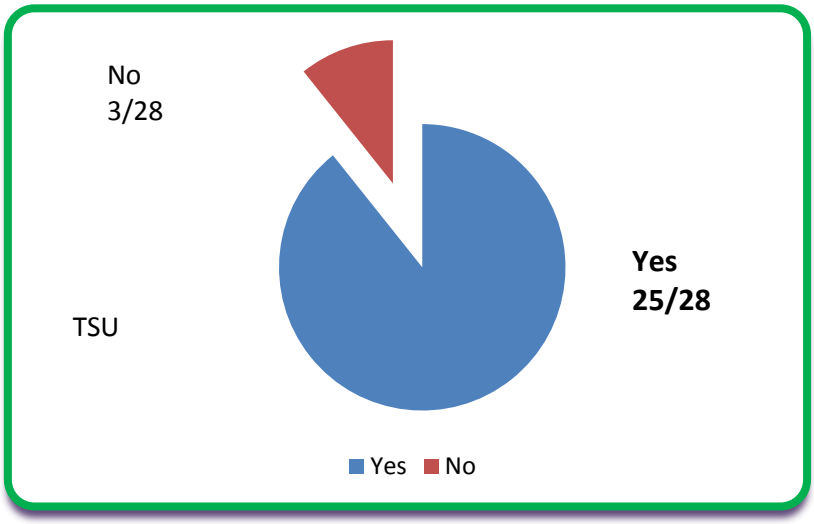
Final data analysis corresponds to questions nineteen and twenty where the effectiveness the INDF with problem- solving materials was evaluated in terms of an industrial repository as a learning tool for English classes including a collections of problem-solving cases of the local industry suggested both by the researcher of this project as well as TSU students. Coxhead & Byrd (2007); Reppen´ s (2001) viewpoint (quoted in Belcher, 2009) state that " ESP specialists can now even compile and analyze their own small, specialized corpora of expert and learner texts " (p.5); that this industrial repository might be considered as a linguistics corpora with specific lexis and grammar structures that is used as a teaching-learning tool to develop ESP skill with critical thinking as using problem-solving materials.

Bearing in mind the overview above and considering the importance of this data analysis, figure 7 examines the final results as follows; twenty-five students asserted positively to the question and only three of the total amount confirmed negatively.

As it can be shown in figure 7 below, the fact that TSU students considered that the industrial repository using the INDF with problem-solving materials, including their own samples, it is worth pointing out that it was not only meaningful and representative for them but also valuable to share with others. Generally speaking, both the INDF and

problem-solving materials could form an industrial repository as a learning tool for English classes to improve TSU students´ ESP skills during their university stay.

Figure 7.Industrial Repository using the INDF with problem-solving cases considered as English learning tool

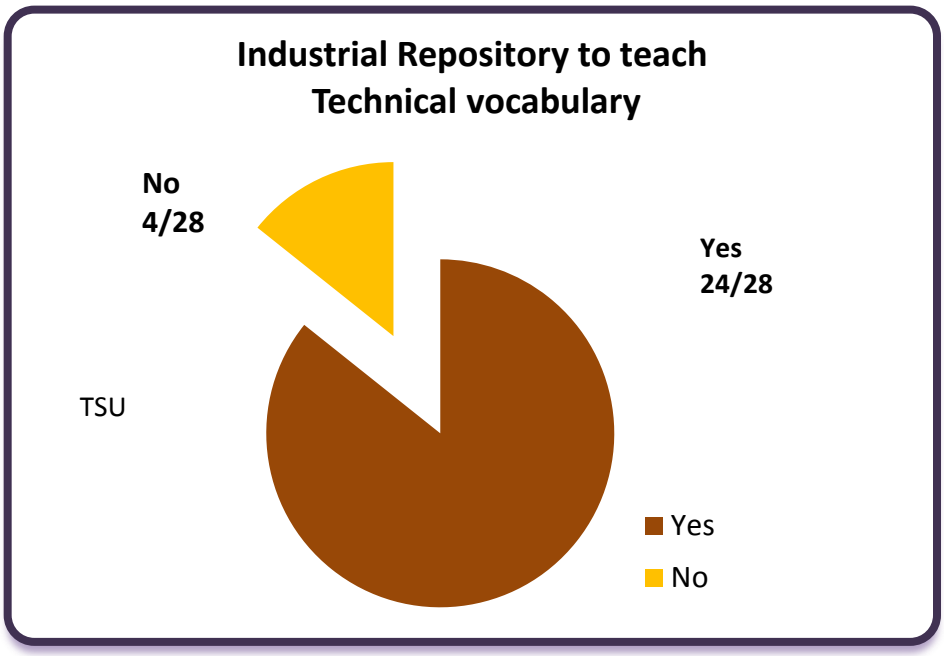


Equally important, in the data from question twenty it can be seen that twenty-four TSU students´ replies correspond to affirmative answers and just a minimal part of the sample did not agree with the rest of the group in the INDF evaluation. See figure 8 to observe final results about last question of the INDF with problem-solving materials evaluation.

According to the answers to question twenty, which evaluates the Industrial repository as a learning too, it was considered that it might help other students of the Industrial Maintenance to get involved in technical vocabulary in context using the INDF with problem-solving materials. In the light of the INDF content, it is important to evaluate the matter of the INDF to be considered as an industrial repository because it not only contains an established format to organize information to analyze problem of machinery in a critical and reasoning way, but also it includes problems of industrial working situations taken from the local industry that in teaching methodology are known

as problem-solving cases which help students to improve their ESP skills. An overview about Industrial Repository applied in the enterprise, it is known as a log book used in the industry as a diary to collect important information about situations of machinery. For instance, total productive maintenance, machinery physical conditions and so on. Then, the INDF evaluation is useful to think about being considered as a simulator of an industrial repository but in this particular case used for academic purposes to develop TSU students´ ESP skills using technical vocabulary in working contexts of the local industry. See figure 8.

Figure 8.Industrial Repository to teach Technical Vocabulary of Industrial Maintenance



In this particular case of figure 7 and 8, it can be concluded that the INDF with problem-solving materials can form an industrial repository as a learning tool for

English classes as well as considered as a simulator of an industrial repository English for specific purposes to teach technical vocabulary real working contexts taken from the local industry.

To conclude this chapter, general assumptions can be drawn on the given results above to evaluate the INDF effectiveness with problem-solving materials applied in different language teaching aspects. The final results from the data analysis show that TSU students had a positive experience in all aspects when they dealt with the INDF. They affirmed to have practiced technical vocabulary as using and describing problem-solving materials related to the industrial maintenance area. Moreover, the INDF helped them practice language skills in a balanced way, specially writing and reading. Nevertheless, in section three TSU students seemed to complain about not being well prepared to have a better individual oral presentation but apparently their experience working on the INDF was productive and they felt satisfied with the final results. Although, they had speaking practice by role-play in class, final results show students needed more speaking training before their oral performance. In sections four, TSU students, thus, argued that time factor represented a limitation to practice speaking strategies previous to their final oral presentation. Also they presume to be required more speaking training during class and after class to be well prepared and in this was to have a better speaking performance at the end of the course.

Another highlight of the INDF evaluation was that it helped TSU students gain some labor experience for their future jobs by using problem-solving materials during the course which made students feel satisfied with their experience as working on the INDF. Finally, TSU students concluded that the INDF can be considered as an industrial repository that can be used as a learning for other students as teaching tool for English teacher.

In order to restate the purpose of the research question along this project, final results support positively the materials evaluation of the INDF when it comes to improve

TSU students´ ESP skills using problem-solving materials, except in oral presentation since it requires to invest more time to practice speaking strategies that might enable TSU students to be more fluent, to have better pronunciation and including grammar and vocabulary too. Similarly, the evaluation of the INDF showed that using problem-solving material might help to develop critical thinking and logical reasoning skills to enable TSU students with mental procedures that will allow TSU students to execute adequately any working situation at the local industry.

All final results are highly valuable to support the evaluation of the INDF that could help TSU students to develop ESP skills at the Universidad Tecnológica with problem-solving materials in a compulsory English course.

CHAPTER V. CONCLUSIONS

5.1 Conclusions

The central issue spread along this paper was to evaluate the effectiveness of the INDF with problem-solving materials focused on industrial working situations from the local industry in order to attempt to develop English for Specific Purposes skills in TSU students of Industrial maintenance school at the Universidad Tecnológica Tula –Tepeji. For this purpose, a present situation analysis (PSA) was considered to investigate TSU students´ needs for the implementation of the INDF as a teaching-learning tool that is the subject of materials evaluation of this paper.

Once the criteria for the INDF evaluation were defined, a questionnaire was designed in four sections by which profitable data was elicited from TSU students´ opinions that allowed highlighting final results. The analysis of the range of final results showed beneficial outcomes that suggest possible feedback for future decision making in order to make objective modifications in the INDF by a systematic procedure guided by materials evaluation principles. According to final results, some conclusions can be drawn from the data analysis in chapter four to attempt to provide responses to the research question posed in chapter 1.

How did the Industrial Need Detection Format help TSU students improve their English for Specific Purposes skills in Universidades Tecnológicas (UTs)?

Estimated final results supported positively the used of the INDF to help TSU students improve their English for Specific Purposes skills by using problem-solving materials. In relation to practice industrial maintenance vocabulary, 89 % TSU students could practice by analyzing, filling and suggesting possible solution using the INDF. However, it is important to consider that 35% about negative answers since it indicates that the INDF needs some modifications to enable TSU students with vocabulary-learning strategies. Atkinson & Raugh´ (1975) viewpoint (quoted in Piribabadi and Rahmany, 2014) state that “one of the best and most effective strategies in improving both immediate and delayed retention of second language vocabulary is the keyword

method" and Higbee´s (2007) contribution (cited in Piribabadi and Rahmany, 2014) states that "this method also deals with building a chain of associations to find information and get it back out when necessary".

On the other hand, and in terms of developing language skills, final results indicate that it can be favorable the use of the INDF; even though, it showed a balanced skills practice skill emphasizing listening and writing, and not speaking and reading. Therefore, it will be important to pay attention specially to speaking because TSU students use English language to express orally their opinions in order to explain a problem with a machine to be solved. Then, the INDF with problem-solving materials might need to be improved to select suitable speaking strategies to enable TSU students to handle the English language in a fluent way.

The last fact from the finding chapter is to consider the INDF as an Industrial repository to be used for academic purposes to share with future students. Similarly, the response was positive from TSU students given the results on section three from the questionnaire and it showed that students were satisfied to practice ESP skill using the INDF materials. Then it could be also mentioned that the use of the INDF could become meaningful and representative for them because it could cover some of the TSU students´ needs; likewise to gain labor experience for their future jobs since school stay as well as to help them improve critical and reasoning thinking skill to provide a suitable respond when they might be asked to solve an industrial working situation.

Although generalizations cannot be drawn from the implications cited above, it can be said that materials evaluation supported by a systematic procedure including defined evaluation criteria, enables English teachers to consider objective reflections to make future modifications in any kind of classroom materials. In this particular case, materials evaluation procedure provided valuable information for decision making mainly to improve vocabulary-learning strategies as well as speaking practices. Hence, not only it is important to teach technical vocabulary presented in real contexts based on specific situations but also essential to include speaking exercises to foster communication among students. The INDF usefulness in the field of English for Specific Purposes as a teaching-learning tool, it is highly useful because it has the

advantage that it deals with problem-solving materials where industrial problematic areas from the local industry are presented to help TSU students improve their ESP skills. Needs analysis helped a lot to determine TSU students´ needs from their present actual situation to implement the INDF as classroom material. ESP principles contributed to set the basis of the materials evaluation in relation to material design with problem-solving cases.

5.2. Limitations of the study

Based on the results found in a group of twenty-eight TSU students and even though it is a representative number of participants, it could be better to consider more TSU students to broaden the materials evaluation of the INDF. Another limitation along this paper was time factor to cover the INDF expectations. According to the final results, there was a lack of time to practice and to improve the language skills specially speaking. However, it can also be assumed that the INDF with problem-solving materials was very ambitious and for that it represented a lot of work to be done for TSU students taking into account that they also had other projects to accomplish their studies. The intention of this study is also to provide information that could help other ESP practitioners in developing their own ESP classroom materials.

5.3 Directions for Further Research

Some suggestions for further research could be exploring and evaluating materials from other contexts such as medicine, business, and law in order to count on other alternatives of materials evaluation where a suitable way to define the evaluation criteria and checklist can be presented. The creation of a bank of questionnaires with established standards of materials evaluation for ESP classrooms materials is highly desirable. Hence, ESP practitioners would have guidance for decision making in materials evaluation. Similarly, it is hoped that future studies might be carried out to develop more classroom materials to improve ESP skills in students that are directly related to industrial working situations to solve real problems posed by the enterprise. Moreover, it is also expected that following research may find out other philosophies equally

important as problem-solving cases with the main intention to enrich ESP material design used as a teaching-learning strategy to continue fostering mental procedures in order to empower students with critical and reasoning thinking skills helpful for their future jobs.

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APPENDIX A. Industrial Needs Detection (INDF)

SITUATION 1	Conveyor belt misalignment		**ENTERPRISE:** Local Industry		
SUBJECT-MATTER SAMPLE	Automation Systems	**APPLICATION AREA**	Production row-Section 2	**DATE**	APRIL-2014
GRAMMAR POINT	Describe a process: first, next, then, after this and finally Passive voice in Present simple " is" Modal: have to and commands				

DESCRIPTION OF THE SPECIFYC CASE	**PREVIOUS EXPERIENCE** **(eliciting ideas)**	**STRATEGY (follow up, what you do to develop the project)**	**RESEARCH (operational manual links, website.)**
The conveyor has had recently, a misalignment in the production area 2 because the motor is having a failure in the rowlocks and bearings, the principal roller is misaligned and that is the reason for the paths and the conveyor belt is dirty so the cost of production is decreasing and the use of raw material is more than the beginning.	-First of all, it is requested an order of work in the area of factory then a supervisor has to be sure the locks are closed -Next, check the power source of the line production area 2 and put locks on the source to nobody can star it up. -Then, dismount the rowlock and transport. Use the correct machinery like cranes and chains -After this, test the functioning of internal workings -Finally, dismount the conveyor part by part.	-The belt conveyor and roller damaged are removed. - Rowlocks installed on the conveyor band and bearings are mounted to be aligned. . Principal roller and the others rollers and whit the end of the conveyor are removed .Weld the spear damaged rollers. -Check the right measurement. Conveyor band have to work on 0.003 inches for the next years.	https://www.google.com.mx/#sclient=psyab&hl=es&site=&source=hp&q=bandas+transportadoras&pbx=1&oq=bandas+transportadoras&aq=f&aqi=&aql=&gs_sm=3&gs_upl=406l10140l0l10859l35l26l1l0l0l1l1578l1859l2-1.8-1l2l0&bav=on.2,or.r_gc.r_pw.,cf.osb&fp=7783e12eb91ed12c&biw=1080&bih=602
KEY WORDS	1. **Rowlock**-chumacera, 2.**bearing**-balero, 3.**crane**-grua, 4.**mount**-montar, 5.**dismount**-desmontar, 6.**welding**-soldar, 7.**roller**-rodillo, 8.**belt**-banda, 9.**conveyor**- banda transportadora, 10.**misalignment**-desalinear, 11. **power source**-fuente de poder, 12.**order of work**- orden the trabajo, 13. **internal working**: funtionamiento interno. 14. **Proximity sensor**: sensor de próximidad.		

SITUATION 2	7000 frame new proposal		**ENTERPRISE:** Local Industry		
SUBJECT-MATTER SAMPLE	Mechanic Systems Assembling	**APPLICATION AREA**	Medium voltage motors production line	**DATE**	APRIL-2014
GRAMMAR POINT	Describe a process: Step one, two, three, four Passive voice in Present simple " are" Prepositions: with, only, since, by				

DESCRIPTION OF THE SPECIFYC CASE	**PREVIOUS EXPERIENCE (eliciting ideas)**	**STRATEGY (follow up, what you do to develop the project)**	**RESEARCH (operational manual links, website.)**
WEG electric motors are manufactured with low and medium voltage line for HGF medium voltage motors these are manufactured only with frames from 5000 until 6000. Then HGF machines are required with frame 7000 by our clients in the national and USA market. Engines currently are not manufactured with this frame so this project suggests to implement an HGF 7000 frame for the new product.	Structure is developed to manufacture a motor armature 7000 First. Write a checklist of new components needed to manufacture the new motor: housing motor, rotor balancing, fans, balancing on three levels rotor Second. Analyze which materials can be purchased in Mexico and those materials that have to be imported from Brazil. Third. Check new machinery needed to implement the new production line. Finally, Design a diagram for the new frame 7000 line production to adapt some components in some machines to manufacture the new product using materials that are compatible with the framework for the project.	Step one. Make the mechanical structure and electric motor (Excel) dimensional engine for client approval considerations. Step Two. Implement the mechanical components to ensure proper assembly for new product. Step Three. Review the checklist of all mechanical components that are quoted based on whether products are imported or domestic products of central Brazil. Step Four. Design Ladder diagram	http://www.weg.net/us/Products-Services/Drives/Soft-Starters/SSW7000-Medium-Voltage-Soft-Starter
KEY WORDS	1. **New project**-Nuevo proyecto, 2. **Housing**- Carcasa, 4. **Fans** – Ventiladores, 5.**Electric motor**- motor eléctrico, 6. **Ladder diagram**- diagrama Ladder, 7. **Engine**-motor 8. **Rotor Balancing**- Balanceo de rotor, 9. **Design**-Diseño, 10.**Balancing on three levels**- Balanceo de Rotor en Tres. 11. **Voltage médium**. Voltaje medio		

SITUATION 3	**Centrifugal Pump Seal**			**ENTERPRISE:** Local Industry	
SUBJECT-MATTER SAMPLE	PHNEUMATIC SYSTEMS	**APPLICATION AREA**	Production area	**DATE**	APRIL-2014
GRAMMAR POINT	Describing a process revision: first-then; second- as well as; then- and, finally-and Present perfect: Have and has ,past participle verbs, regular and irregular Prepositions: recently, since and for				

DESCRIPTION OF THE SPECIFYC CASE	**PREVIOUS EXPERIENCE** **(eliciting ideas)**	**STRATEGY (follow up, what you do to develop the project)**	**RESEARCH (operational manual links, website.)**
Centrifugal pump has recently had problems with its operation. Bearings, as well as the mechanical seal had presented failures for the last three days. As a result there is a lot of production and has not delivered on time and it has broken the chain of production affecting the materials quality services of the company provides.	First, de-energize and lock the centrifugal pump, then, decoupling the motor pump. Second, disarm and remove the impeller as well as bearing caps using a bearing puller to remove the damaged bearings. Then, loosen the mechanical seal and clean the mechanical parts. Finally, replace the mechanical seal and assemble the pump, test and monitor the machine to check betterments.	1. Search bearings and mechanical seal suitable for the reparation. 2. Modify preventive maintenance program and identify potential failures and likewise reduce line stoppages in production. 3. Check the stock of spare parts for this pump in order to reduce maintenance time. 4. Write a report of the centrifugal pump; alternating current and horse power are stabled in the pump performance.	www.industriascemu.com/DATOS%20TECNICOS%20DE%20**BOM** www.motoresbellucci.com.ar/**bombascentrifugas**.htm fainweb.uncoma.edu.ar/La.M.Hi/textos/.../**BOMBAS**.PDF
KEY WORDS	1. **Centrifugal pump** – Bomba centrifuga, 2.**Bearing puller** – extractor, 3. **Mechanical seal** – sello mecánico, 4. **Bearing** – rodamiento, 5. **Preventive maintenance**- mantenimiento preventivo, 6**. potential failures** – fallas potenciales, 7. **mechanical parts** – partes mecanicas, 8. **stoppages** – paros, 9. **pump** – bomba, 10.**Alternating current** – Corriente alterna, 11.**Horse power** – Caballos de potencia.		

SITUATION 4	NUMERICAL LATHE CNC		**ENTERPRISE:** Local Industry		
SUBJECT-MATTER SAMPLE	Preventive Maintenance Program	**APPLICATION AREA**	Production row- Section 2	**DATE**	APRIL-2014
GRAMMAR POINT	Describe a process: firstly, secondly, then and finally. Active voice in simple present tense and commands				

DESCRIPTION OF THE SPECIFYC CASE	**PREVIOUS EXPERIENCE** **(eliciting ideas)**	**STRATEGY (follow up, what you do to develop the project)**	**RESEARCH (operational manual links, website.)**
The problem in the lathes is when the piece that is manufacturing does not have the correct position in the center dish and the gun turret can break the manufacturing piece. The problem is caused by the wrong gun turret´s position (15mm maximum) to keep the piece in the center of the trail. Otherwise, it is needed to remove and unscrew the gun turret to adjust the piece in the gun turret then align the center's dish and stat up the lathe again. This takes time and it implies a great problem with the production row, section 2.	Firstly, check electro valves water motor. Secondly, review the valve to fast the gun turret and the spin of the lathe, Then, set the piece that is manufacturing on lathe and monitor the bypass valve when the refrigerant is turned on. Finally, program the lathe with new instruction, selecting with the button rotating multi-position on the control panel. Adjust the axes to complete the manufacturing piece.	Choose suitable tools such as the direction of spin according to the manufacturing piece. Align, the gun turret, spin, dish and the piece with axes and gas. Program manual with the correct coordinates x for the piece manufactured and z for the time of manufacturing. Program preventive maintenance for gun turret and axes as well as dish of the lathe to keep their machine working in good conditions.	germanico.glz@itesm.mx

KEY WORDS	1. **gun turret**. Torreta de la pistola, 2.**refrigerant**- refrigerante, 3.**tool**-herramienta, 4.**gag**- mordaza, 5.**machine** – maquina, 6.**lathe**- torno, 7.**buttom rotating**- botón rotador, 8.**turret**- torreta, 9.**axe**-cortadora, 10.**center dish**-centro de plato , 11.**multi-position**-multipocisición.

SITUATION 5	Belt conveyor in thermal plants		**ENTERPRISE:** Local Industry		
SUBJECT-MATTER SAMPLE	Mechatronic systems	**APPLICATION AREA**	Production row- Section 2	**DATE**	APRIL-2014
GRAMMAR POINT	Describe a process: first, next, then, after this and finally. Use number to describe a process Passive voice in Present simple and commands review Modal: Passive voice with " can " Prepositions: by				

DESCRIPTION OF THE SPECIFYC CASE	**PREVIOUS EXPERIENCE** **(eliciting ideas)**	**STRATEGY (follow up, what you do to develop the project)**	**RESEARCH (operational manual links, website.)**
Fire accidents are commonly in thermal plants in section 1 where the main production line of the final product is shipped. Those accidents can be caused by speed variation when the oil level tears up in the fluid coupling of the conveyor motor. This damage in the conveyor band can cause wasting time in the quality final product and it can increase production cost and not to be able to complete the work orders on time.	First of all, write a checklist of all electronics components to design a diagram for the PLC installation. Second, install the insulated electrode oil to detect oil drains and set a coal conveyor. Then, set an emergency stop (E-Stop) including a LED for warning operations Finally, put a synthetic rubber belts which move on metallic rollers called idlers to avoid overheating and fire accidents.	1. – Build a Flowchart to the implement the automation process of the greenhouse. 2. – Design a state diagram of the automation the conveyor band. 3. – Simulate the adaptive control operation in the Lab view software. 4. - PLC Programming to control all the variable (wireless sensor, humidity sensor, LM35 series temperature sensor, and fire detector) 6. - Test the operating devices before start up the conveyor band(humidity sensor, temperature sensor, irrigation system) 7.-The signals generated by the control variables such as humidity sensors, temperature and photocells, will be interpreted by the PLC and those signals will be transferred to the secondary elements and at the same time those signals will be visualized by the LabView virtual platform.	http://www.ijareeie.com/upload/2014/apr14-specialissue4/36.pdf http://www.tetrixrobotics.com/GettingStartedGuide/files/addons/conveyorBelt/Programming/programmingGuides/LV_ProgGuide.pdf
KEY WORDS	1. **fluid coupling**-acoplamiento de fluidos, 2. **Coal conveyor**- banda de carbono, 3. **PLC**. Programable logic controller, 4. **electronics components**-componentes electrónicos, 5. **synthetic rubber belts-** bandas sintéticas de caucho, 6. **Idlers-**rodillos, 7. **humidity** - humedad, 8.**temperature**-temepratura, 9. p**hotocells**- fotoceldas, 10.**signal** - señal, 11. **LabView**. Software para programar PLC		

APPENDIX B. Instrument for the INDF Evaluation

Questionnaire

Students of fifth Quarter in Maintenance school at Universidad Tecnológica.

This questionnaire will help me to evaluate the Industrial Needs Detection Format (INDF) that we have used during the past three years (2011-2013). I will greatly appreciate your help in order to improve my teaching practice. Please circle the answer that best applies to you.

Section 1. Practice of Technical Vocabulary
Do you think, you can practice technical vocabulary about Industrial Maintenance area…

1. analyzing and solving-problems described in English that shows a specific case of the local industry that you have worked for or will need in the future?
   Yes **No**

2. filling in the Industrial Needs Detection Format (INDF), that you used for your project and described a case to study of the local industry, and wrote your previous experience?
   Yes **No**
3. filling in the INDF to suggest to solve the problem?
   Yes **No**

Section 2. Industrial Needs Detection Format evaluation
The information from the INDF can help you to develop your …

4. Listening skill with technical vocabulary in context? **Yes** **No**
   Ranking from 1 to10 _____
   (1 =minimal and 10 = maximum)
5. Reading skill with technical vocabulary in context? **Yes** **No**
   Ranking from 1 to10 _____
   (1 =minimal and 10 = maximum)
6. Writing skill with technical vocabulary in context? **Yes** **No**
   Ranking from 1 to10 _____
   (1 =minimal and 10 = maximum)
7. Speaking skill with technical vocabulary in context? **Yes** **No**
   Ranking from 1 to10 _____
   (1 =minimal and 10 = maximum)

The information from the INDF is useful …

8. when you try to explain it to the others in front of the group?
   Yes **No**

9. to practice role- play in class? **Yes** **No**
10. to train you for oral individual presentation? **Yes** **No**
11. to gain some labor experience for your future jobs? **Yes** **No**

Section 3. Oral Presentation

After having worked in teams, done the research in the local industry, filled in the INDF, You…

12. were ready to make an oral presentation **Yes** **No**
13. needed more speaking exercises, like role-play and simulation previous to the oral presentation? **Yes** **No**
14. believe that time was a limitation to have more speaking practice before the oral presentation? **Yes** **No**
15. practiced communicative activities? **Yes** **No**
16. had time to practice the technical vocabulary in communicative activities? **Yes** **No**
17. had time to prepare your oral presentation using communicative activities in class? **Yes** **No**
18. were you satisfied with your final result? **Yes** **No**

Section 4. Industrial Repository

Industrial Repository as a language teaching tool.

19. Do you consider your work can be part of a collection of need detections of the local industry and be part of an industrial repository for the English class? **Yes** **No**
20. Do you think that the industrial repository will help other students of the Industrial Maintenance to get involved in technical vocabulary in context? **Yes** **No**