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EFL Teachers' Views and Implementation of Problem-Solving Tasks in the Algerian Secondary Schools

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Abstract

The present paper addresses the issues of EFL teachers' views and implementation of problem solving in third-year classes in the Algerian Secondary Schools. The focal aim is to highlight the importance of problem solving as a means to improve the activities of teaching and learning. The survey involved a random sample of 50 teachers to whom a questionnaire was administered. Marzano's (2001) New Taxonomy of Educational Objectives was used as the analytical framework. According to the obtained findings, teachers (96%) agreed that problem solving is a crucial component of instruction. The majority of teachers claimed that they implement problem-solving tasks in the classroom. The main benefits of implementing problem solving in the classroom that the respondents mentioned include: the development of students' cognitive abilities, their autonomy, and the teaching practices. The findings have important implications for pedagogical strategies that might promote the teaching and assessment of problem solving in EFL contexts.

Keywords: problem solving, EFL, Algerian secondary schools, teaching, assessment

1. Introduction

Problem solving is an essential ingredient in teaching and learning that should be stressed and promoted by teachers through their daily practices. The importance of problem solving is highlighted by many authors like Jonassen (2011) who asserts that "problem solving is generally regarded as the most important cognitive activity in everyday and professional contexts" (p. 353). This appears to suggest that knowing how to solve problems is crucial in school contexts, as well as in real-life situations. With regard to this study, a key issue that deserves consideration, therefore, may be what should be done to allow students of English as a foreign language (EFL) to become competent problem solvers to be able to approach new language problems creatively. One reasonable answer to this issue is to teach and asses problem solving appropriately, following effective techniques and procedures. This concern brought about the idea of carrying out a study aiming at analyzing EFL teachers' views and practices in problem solving in some Algerian Secondary Schools through the elaboration of a questionnaire distributed to teachers performing in two Algerian provinces: Tizi-ouzou and Bouira. In this paper, the New Taxonomy of Educational Objectives by Marzano (2001) was used as the analytical framework.

It is worth mentioning that teachers are expected to involve their students in problem-solving tasks that trigger their intelligence and creative abilities. Greater progress in teaching EFL can be achieved if students are offered opportunities to resolve unknown issues through verbal and written communication skills. Clearly, to promote instruction EFL teachers need to encourage their students to regularly do challenging activities in the four language skills taking into account the students' cognitive abilities. Investigating teachers' attention to the importance and implementation of the basic issues about problem solving represents the focal aim of this study. This research supports the idea that there is no effective teaching/learning process without effective problem solving. Through such survey, teachers can provide answers on which generalizations can be made.

1.1 Statement of the Problem

Education in third-year classes in the Algerian Secondary Schools tends to stress traditional ways of teaching and assessment in which, in most cases, the students are expected to produce single-right answers. Instead, in order to meet today's educational needs, the learners should be given opportunities to approach problem-solving tasks creatively. Consequently, the study intends to investigate the EFL teachers' perceptions and attitudes towards the importance of problem solving as an effective means of developing instruction by making it suitable for the present climate of complexity and innovation.

1. 2 Research Questions

The present study attempts to investigate the EFL teachers' views, their teaching and assessment of problem solving. For so doing, four research questions are asked:

1. How important is problem solving for the EFL teachers in third-year classes of the Secondary schools of Tizi-ouzou and Bouira?

2. How difficult is the implementation of problem-solving tasks for the teachers?

3. What are the main benefits of implementing problem-solving tasks in the classroom?

4. Do the teachers teach and assess problem solving using appropriate strategies?

1.3 Research Hypotheses

To provide answers to the research questions, the following hypotheses are put forth:

H01: Problem solving for the teachers is slightly important.

H02: The teachers view the implementation of problem-solving tasks as being easy.

H03: According to the teachers, the main benefits of implementing problem-solving tasks in the classroom are the development of students' language skills and thinking.

H04: The teachers do not use appropriate strategies to teach and assess problem solving.

2. Literature Review

The literature on problem solving shows that a wide range of definitions have been brought to the concept by authors (Duncker & Lees, 1945; Jonassen, 2011; Polya, 1962; Shaftel & Shaftel, 1967; Shuell, 1990). An examination of the authors' definitions indicates that for all of them problem solving is exclusively tied to novel problems that cannot be solved routinely or mechanically. The idea is that problem solving involves issues that trigger students' intelligence and creative faculties to handle unexpected problem situations. In this paper, Shaftel and Shaftel's (1967) definition of problem solving is adopted because the authors provide a very explicit definition where they insist on risk-taking in problem solving training:

In essence this view of problem solving conceives of it as a discovery process, a search—one that often requires creative thinking and the eventual synthesis of many ideas. Such a procedure does not flourish in a school environment that emphasizes only the "right" answer and that is based on the intellectual authority of the teacher. It requires an atmosphere in which it is safe to speculate, to guess, to test out ideas even at times to be wrong. It is a search in which all notions are respected for try-out, then critically evaluated for their consequences. Problem-solvers need a zest for exploration; they need to learn to really listen to each other's ideas before accepting or challenging counterproposals. (p. 44)

A careful consideration of Shaftel and Shaftel's definition indicates that 'discovery learning' is included in it. Richards and Schmidt (2013) contend that in the context of this constructivist approach learners "develop processes associated with discovery and inquiry by observing, inferring, formulating hypotheses, predicting, and communicating" (p. 176). Two main benefits are associated with such processes. On the one hand, they allow the students to reinvest their background knowledge and get involved in solving problems creatively. On the other hand, they make the teaching/learning process more motivating and enjoyable. Solving problems means for Shaftel and Shaftel getting involved in what refers to such processes as "to speculate, to guess, to test out ideas even at times to be wrong" (p. 44). In brief, the students are encouraged to take risks and try again and again. The focus is on the process of problem solving and not on the production of single-right answers.

Many scholars have clarified that problem solving is a complex and higher-cognitive skill (Brookhart, 2010; Gross & McDonald, 1958; Heine, 2010; Palumbo, 1990; Schunk, 2012; Shuell, 1990). For instance, Heine (2010) maintains that research on problem solving "investigates how humans solve complex tasks for which they do not have any immediate solutions" (p. 27). Similarly, "for problems that require higher-order thinking, the solution strategy is not immediately apparent" (Brookhart (2010, p. 100). The implication of Heine's and Brookhart's statements for the teaching of problem solving is that the skill goes beyond simple tasks to include those tasks which are complex. In other words, complex tasks require students to analyze, synthesize, create new ideas and options, evaluate, infer, apply knowledge creatively in novel situations, and think critically.

There is no doubt that involving students in a range of practical tasks that require them to be productive rather than reproductive gives them plenty of opportunities to develop their problem-solving skills. It has been clarified by Moseley, Baumfield, Elliott, Gregson, Higgins, Miller, and Newton (2005) that "reproductive skills generally map onto Bloom's categories of knowledge, comprehension, and application, while productive skills involve analysis, synthesis, and evaluation" (pp. 254-255).

2.1 Previous Findings

Irwanto, Saputro, Rohaeti, and Prodjosantoso (2018) conducted a research work in Indonesia at the Universitas Muhammadiyah Ponorogo, in which 48 participants were involved. They found that Process-Oriented Guided-Inquiry Learning (POGIL) can improve students' problem solving skills. In addition, the authors (2018, p. 778) believe that "students' skills will increase if they are involved in problem solving and succeed in finding the solution." Indeed, the skills that can be promoted by problem solving may include methodological skills, writing skills, speaking skills, and thinking skills.

A study on creative problem solving skills of arts and sciences was carried out by Williamson in 2011. In the study, problem solving tests were completed by one hundred and sixteen (116) undergraduate students from a post-1992 UK university. Williamson (2011) came to the result that in arts and sciences, problem solving requires both divergent and convergent skills. More explicitly, a convergent problem requires one right solution whereas divergent problems can be solved by generating various solutions (Finke, Ward, & Smith, 1992 as cited in Smith & Ward, 2012). In the case of divergent problems, students should go beyond recall of information to become able to analyze and evaluate.

Greiff, Wüstenberg, Fischer, Funke, Molnár, and Csapó investigated complex problem solving in Hungarian high schools. The study involved 855 students in Grades 5 to 11. The authors found that complex problem solving is "a two dimensional construct with the dimensions knowledge acquisition and knowledge application" (2013, p. 373). The first is equivalent to input and the second to output.

Scherer and Gustafsson (2015) carried out a study on the issues of 'openness', 'perseverance', and 'performance' in creative problem solving in Australia, Norway, and Singapore. The study involved 16,188 students (aged between 15.3 and 16.3) in 1,239 schools using a questionnaire and performance tests. The researchers came out with the idea that 'openness' and 'perseverance' are two constructs of students' motivation to solve problems. The former refers to students' beliefs to solve problems successfully (Bong & Skaalvik, 2003; Schulze et al., 2005 as cited in Scherer & Gustafsson, 2015) while the latter relates to students' determination to overcome difficulties and get appropriate solutions (Wirthwein et al., 2013 as cited in Scherer & Gustafsson, 2015).

3. Methodology

3.1 Design of the Study

The present study is a survey that adopted a descriptive research design relying principally on a quantitative approach. In this respect, de Vaus (2001, p. 10) explains that "social surveys and experiments are frequently viewed as prime examples of quantitative research." In addition, he (2001, p. 1) sustains that "social researchers ask two fundamental types of research questions: 1) What is going on? (descriptive research); 2) Why is it going on? (explanatory research)." Moreover, Brown (2011, p. 192) indicates that "descriptive studies are those that describe behaviors, outcomes, scores, etc. using statistics such as frequencies, percentages, and descriptive statistics." All in all, a descriptive study should focus more on reporting facts as they are than on providing explanations.

3.2 Sample/Participants

The target population of the present study consists of EFL teachers of some schools of two Algerian regions: Tizi-ouzou and Bouira. All the participants teach students who are preparing for their Baccalaureate Examination (An official and national exam in Algeria that the students should pass in order to study at a university). The current study adopts a random sampling that Saris and Gallhofer (2007) view as foundational in survey research. This clearly indicates that random sampling helps to get reliable and valid results.

As regards the sample size, the number of the participants is fifty (50). On this, Dörnyei (2003) explains that:

> from the perspective of statistical significance, the principal concern is to sample enough learners for the expected results to be able to reach statistical significance […] a good rule of thumb is that we need around 50 participants to make sure that these coefficients are significant and we do not lose potentially important results. (p. 74)

It is on the basis of this quotation that we managed to have a sample size of 50 teachers. In addition, in this study the formula used for simple random sampling is Slovin's Formula, and it is as follows:

$n=N\div (1+Ne^2)$

n = the sample size N = Total population **e** = Error tolerance.

Total population: 96

Error tolerance: 10%

The number of samples needed for a population of 96 is:

$n= 96\div (1+96\times 0.1^2) = 48$

3.3 Instrument

This study was carried out using a questionnaire that comprises four sections. The first is entitled 'General Information about the Participants' and it is about the respondents' work experience, professional training, and academic degree. The second, called 'Teachers' Views about Problem Solving', seeks to figure out how teachers view problem solving in terms of difficulty, importance, and advantages. Section three 'The Teaching of Problem Solving' addresses the

issues of teaching problem solving strategies, approaches, and the teachers' involvement of students in individual and collaborative problem solving. The last section 'Teachers' Implementation of Problem Solving in the Classroom' centers on the assessment of problem solving with the aim of exploring how often the teachers ask their students to solve problems. Data collection started in March 2018 and ended in June 2018. Thirty-four (34) participants responded through emails and sixteen (16) by handing back the questionnaire.

3.3.1 Piloting the Questionnaire and Conducting Item Analysis

To construct questionnaires effectively, it is important to test and pilot them (Dörnyei, 2003). Undoubtedly, the piloting phase is a key to the improvement of the questionnaire content and structure. In this study, the piloting phase lasted three weeks and involved 15 participants: 10 from the target sample and 5 are teachers in the Department of English at X University having experience in the field of research. The final objective of the piloting was to design a questionnaire that could be reliable, clear, and easy to answer. The piloting phase helped to get valuable feedback on the structure and content of the questionnaire. Accordingly, changes were made in several of its parts as Table 1 illustrates:

Table 1. An illustration of the piloting phase of the questionnaire

The item before the piloting phase	The item after the piloting phase	Comments
What strategies do you think fit(s) best problem-solving? (You can cite more than one). (No suggestion of the strategies before the piloting phase)	Which of the following strategies do you think fit(s) best problem-solving? (You can choose more than one). ■ To use a solution to a similar, earlier problem to help in solving a new one. □ ■ To identify the "ends" you target and then figure out the "means" you will use to reach them. □ ■ To use heuristics (a heuristic is a general rule that is usually correct). □ ■ To use an algorithm (a method that will always produce a solution to the problem, although the process can sometimes be inefficient). □	After the piloting, a list of heuristics has been proposed to the respondents in order to make the question clearer and easy to answer.

3.4 Data Collection

To conduct the present study, the researchers selected fifteen (15) schools from Tizi-ouzou and ten (10) from Bouira. The number of teachers from the schools of Tizi-ouzou was 60, and the number of those from Bouira was 36. That makes a total number of 96 informants. A questionnaire was randomly administered to the teachers so that anyone of them could have the chance of being included in the sample. The administration procedure was done either by handing the questionnaire to the teachers or by emailing it to them. Because the researchers did not have the teachers' email addresses, they resorted to meeting their respective supervisors (inspectors) to request their assistance for emailing the questionnaire and explaining the task. Most of the data were gathered through emails. Indeed, 35 questionnaires were filled in by the emailed teachers and only 15 were handed back by other teachers. The researchers did not take into account all the questionnaires which were not informed (completed) appropriately. After the collection of the questionnaire results, the analysis of the data was reported in descriptive statistics.

3. 5 Data Analysis

The research at hand adopted descriptive statistics and uses SPSS (Statistical Package for the Social Sciences). However, in Tables 9 and 11, Microsoft's Excel is used because the two tables include many variables and the use of SPSS is inappropriate. Besides, content analysis is used. It serves to interpret the data contained in texts such as the answers that respondents give to open-ended questions in questionnaires or interviews (Birmingham & Wilkinson, 2003). As to SPSS**,** Dörnyei (2007) sustains that "it is appropriate for people who have little experience in statistics

and programming because of its user-friendly interactive feature" (p. 198). This program is used for the analysis of the quantitative data of the study in terms of meaningful statistics. In addition, it should be mentioned that the interpretation of the results is done with reference to the theoretical framework and the literature review, and this from a social constructivist perspective. In regard to this perspective, Oldfather, West, White, and Wilmarth (1999) support that "a social constructivist perspective focuses on learning as sense-making rather than on the acquisition of rote knowledge that 'exists' somewhere outside the learner" (p. 9). This vision of learning underlines the students' actions in taking initiatives and working reflectively with the guidance of their teachers.

The analytical framework adopted in the present study is Marzano's New Taxonomy (2001). Three systems make up the Taxonomy, but in this article focus is put only on the cognitive one. The Taxonomy includes six levels which are depicted in Figure 1.

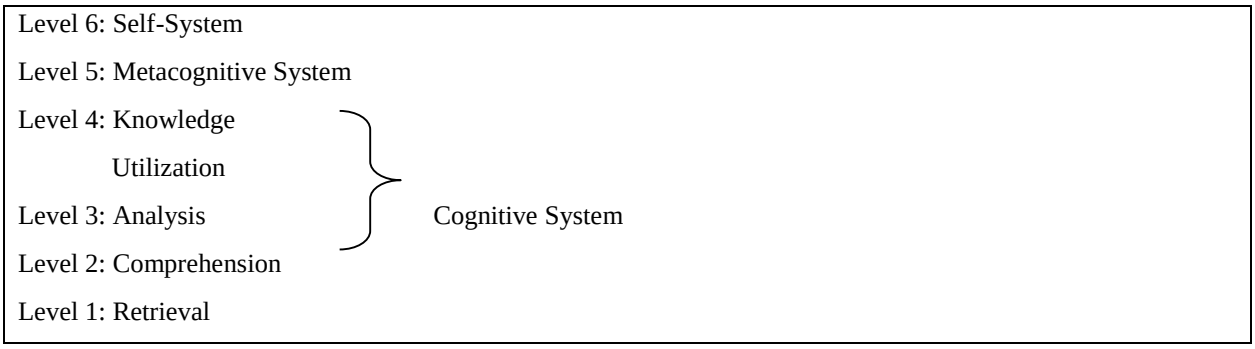

Figure 1: The six levels of the New Taxonomy (Marzano, 2001, p. 30)

Level 1 of the taxonomy is called 'retrieval' or 'recall' and it is the process in which knowledge stored in permanent memory is activated and transferred to working memory as, for example, retrieving the date of an event. Level 2 is 'comprehension' that accounts for the translation of knowledge into a form that can be appropriately kept in permanent memory and it involves 'synthesis' and 'representation'. On the one hand, 'synthesis' is defined as the division of knowledge to its most important parts and, on the other hand, 'representation' relates to the creation of 'symbolic analog' of knowledge, as well as translating knowledge into 'symbolic', 'imagery' mode. Level 3, 'analysis' involves the broadening of knowledge in a reasonable way. The analysis processes are: (1) 'matching', (2) 'classification', (3) 'error analysis', (4) 'generalization', and (5) 'specification'. 'Matching' is about identifying similarities and differences between components of knowledge. It involves problem solving when similarities and differences can be creatively and intelligently identified. 'Classification' involves the organization of knowledge into categories that make sense. 'Error analysis' deals with "the logic or reasonableness of knowledge" following a set of criteria. Generalization refers to "the process of constructing new generalizations from information that is already known." Involved in this process, there is 'inference.' The latter gravitates more towards induction than deduction. Last but not least, 'specifying' involves the generation of "new applications of a known generalization or principle." Level 4 of the Taxonomy involves 'Knowledge Utilization.' The processes involved in this level were used "to accomplish a specific task" and they include four broad categories: (1) 'decision making', (2) 'problem solving', (3) 'experimental inquiry', and (4) 'investigation' (Marzano, 2001, pp. 46-47).

It is to be indicated that in this paper the focus is only on decision making and problem solving as two levels of Knowledge Utilization. The remaining two levels ('experimental' enquiry and 'investigation') are not included in the current study for two main reasons. First, the two levels are not among the prerequisite skills in the program designed for the students. Second, though the two levels belong to problem solving they seem to be extremely challenging at least to the majority of the students. Thus, there is no need to include them in the study. Decision making takes place "when an individual must select between two or more alternatives" (Halpern, 1984 as cited in Marzano, 2001, p. 45). In this vein, attention should be drawn to the fact that decision making has nothing to do with guessing; because well-established criteria allowing students to justify their choice (s) should be met.

4. Results

4.1 General Information about the Participants

4.1.1 Professional Experience

Q1: How long have you been teaching English?

● Less than 5 years □ ● From 5 to 10 years □ ● More than 10 years □

Table 2. Work experience of the participants

Work Experience	Counts	Percentage	Valid Percentage	Cumulative Percentage
Less than 5 years	8	16.0	16.0	16.0
From 5 to 10 years	16	32.0	32.0	48.0
More than 10 years	26	52.0	52.0	100.0
Total	50	100.0	100.0	

The results indicate that few (16%) participants have a work experience of less than 5 years, 16 (32%) have an experience which goes from 5 to 10 years and 26 teachers (52%) have an experience which exceeds 10 years. This implies that the majority of the respondents are experienced teachers who are expected to know how to teach and assess problem solving effectively. In this respect, it is important to clarify that "researchers frequently specify that an individual must have practiced for at least ten years in his or her area in order to qualify as an expert" (Ericsson, 2003b; Kellogg, 2006 as cited in Matlin, 2009, p. 251).

It is to be noted that stakeholders should care about teachers' experience. This requires the evaluation of the teachers' practices. According to Bartlett (2003), "this evaluation provides the basis for the professional judgment which the worker must constantly make and which determines the direction of his activities" (p. 269).

4.1.2 Professional Training

Q2: Have you ever received any professional training in English teaching?

Yes □ No □

If yes, would you specify the type of training?

Table 3. The participants and professional training

Professional Training	Counts	Percentage	Valid Percentage	Cumulative Percentage
Teachers who have received professional training	32	64.0	64.0	64.0
Teachers who have not received professional training	18	36.0	36.0	100.0
Total	50	100.0	100.0	

It appears from the findings in Table 2 that 32 (64%) of the respondents received professional training, whereas 18 (36%) did not. As regards the type of training, the respondents' answers varied. That is, they received different types

of training: at university, in seminars, online training and abroad, at the Teachers' Training School, ITE (Institut de Technologie et de L'éducation) meaning in English (Institute of Technology and Education situated in Algiers), in Secondary School, and ENS (Ecole Nationale Supérieure or in English Higher National School located in Algiers).

The informants mentioned that they received pedagogical training, and one respondent reported that he/she received, in addition to pedagogical training, psychological one. Both of pedagogical and psychological trainings are important in that they enlighten teachers and make them aware of the appropriate ways to teach and treat their students. On the point, Richards and Farrell (2005) explain that:

Training involves understanding basic concepts and principles as a prerequisite for applying them to teaching and the ability to demonstrate principles and practices in the classroom. Teacher training also involves trying out new strategies in the classroom, usually with supervision, and monitoring and getting feedback from others on one's practice. (p. 3)

Training renders teachers capable of knowing about their students' learning styles and understanding. This is important because "gaining a deeper understanding through reflection and analysis on the way a student is processing information also allows the instructor to more effectively assist students both on an individual and collective level" (Fennema et al., 1996 as cited in Guise et al., 2017, p. 6). As a result, teacher training ought to be among the mostly stressed elements of a promising educational policy.

4.1.3 Academic Degree

Q3: What is your academic degree?

1/ Licence □ 2/ Master □ 3/ Magister □ 4/ Doctorate □

Table 4. The participants' academic degree

Teachers' Academic Degree	Counts	Percentage	Valid percentage	Cumulative Percentage
Licence	39	78.0	78.0	78.0
Master	10	20.0	20.0	98.0
Magister	1	2.0	2.0	100.0
Total	50	100.0	100.0	

Remark: None of the respondents has opted for the Doctorate degree

Table 4 reports that 39 (78%) of the participants hold a Licence (Bachelor) degree, 10 (20%) a Master degree, 1 (2%) participant holds a Magister degree, and no one holds a Doctorate degree. Therefore, all the respondents have a degree that allows them to teach in the appropriate way. This, nevertheless, does not mean that they are all successful teachers. In other words, a degree should be backed by personal efforts and devotion in order to help students build knowledge successfully. In other words, any mismatch between academic degrees and performance will, in a way or in another, negatively affect students' learning.

4.2 Teachers' Views about Problem Solving

Q1: How difficult is the implementation of problem solving in the classroom?

(1) Very difficult □ (2) Difficult □ (3) Slightly difficult □

(4) Slightly easy □ (5) Easy □ (6) Very easy □

Table 5. Teachers' views of the implementation of problem solving in terms of difficulty

The Degree of Difficulty	Counts	Percentage	Valid Percentage	Cumulative Percentage
Very difficult	4	8.0	8.0	8.0
Difficult	18	36.0	36.0	44.0
Slightly difficult	19	38.0	38.0	82.0
Slightly easy	4	8.0	8.0	90.0
Easy	3	6.0	6.0	96.0
Very easy	1	2.0	2.0	98.0
No Answer	1	2.0	2.0	100.0
Total	50	100.0	100.0	

The key findings in Table 5 indicate that 4 (8%) teachers view the implementation of problem solving as being 'very difficult', 18 (36%) as 'difficult', 19 teachers (38%) as 'slightly difficult', 4 (8%) as 'slightly easy', and 3 (6%) as 'easy.' The difficulty of implementing problem solving relates to the fact that this skill involves a multitude of cognitive processes such as intelligence, creativity, and critical thinking.

It should not go unmentioned, though, that a comprehensive approach is vital to cope with the difficulty of implementing problem solving in classrooms. Clearly, teachers can provide their students with problem solving models as the one developed by Bransford and Stein (1993), which is called the IDEAL approach standing for: 'Identify problems and opportunities', 'Define goals', 'Explore possible strategies', 'Anticipate outcomes and Act', and 'Look Back and Learn.' Moreover, the problem-solving tasks that teachers assign their students should be moderately challenging in order to keep students motivated and satisfied with the teaching situation.

Q2: How far do you agree or disagree with the statement: "There is no effective teaching/learning process without effective problem-solving tasks."

(1) Strongly agree □ (2) Agree □ (3) Partly agree □

(4) Slightly disagree □ (5) Disagree □ (6) Strongly disagree □

Table 6. Teachers' views about the link between effective instruction and effective problem solving

Teachers' Agreement or Disagreement	Counts	Percentage	Valid Percentage	Cumulative Percentage
Strongly agree	16	32.0	32.0	32.0
Agree	25	50.0	50.0	82.0
Partly agree	7	14.0	14.0	96.0
Disagree	1	2.0	2.0	98.0
No answer	1	2.0	2.0	100.0
Total	50	100.0	100.0	

The main results in Table 6 mention that 16 teachers (32%) strongly agree with the statement that "There is no effective teaching/learning process without effective problem-solving tasks." In addition, 25 teachers (50%) agree, 7 (14%) teachers partly agree, and one teacher (2%) disagrees. One can infer that the majority of teachers agree that effective problem solving tasks are of considerable importance in the teaching/ learning process. About the significance of problem solving in education, Popper (1972) contends that "science starts from problems (rather than from observations or even from theories […]" (p. 181). This clearly attracts the educators' attention to have at their disposal a strong education system to enhance students' achievements in problem solving.

The very sense of instruction consists in the preparation of students to become citizens capable of displaying a range of skills when approaching problem situations. In this respect, Jonassen (2004) argues that "the only legitimate goal of education and training should be problem solving. Why? Because people need to learn how to solve problems in order to function in their everyday and professional lives" (p. 2). There is, therefore, all the more reason why effective instruction goes with effective problem-solving.

Q3: "Assessing learners' abilities to solve new problems should be stressed by all teachers."

(1) Strongly agree □ (2) Agree □ (3) Partly agree □

(4) Slightly disagree □ (5) Disagree □ (6) Strongly disagree □

Table 7. Teachers' views about the necessity to assess learners to solve new problems

Teachers' Agreement or Disagreement	Counts	Percentage	Valid Percentage	Cumulative Percentage
Strongly agree	21	42.0	42.0	42.0
Agree	25	50.0	50.0	92.0
Partly agree	3	6.0	6.0	98.0
Disagree	1	2.0	2.0	100.0
Total	50	100.0	100.0	

Table 7 shows that 21 (42%) of the teachers strongly agree with the statement: "Assessing learners' abilities to solve new problems should be stressed by all teachers", 25 teachers (50%) agree, and three others (6%) partly agree, and one teacher (2%) disagrees. The respondents' answers confirm their position towards the necessity of assessing learners' abilities to solve new problems. If such a position is concretized by the teachers in the classroom, the teaching/learning process will likely to be open for opportunities that allow students to use their mental faculties, namely intelligence and analytical thinking. In this respect, Jonassen (2011, p. 353) writes "probably the fastest way to enhance learning in schools, universities, and corporate training venues is to implement assessments that assess meaningful learning, such as problem solving."

The necessity to assess students' abilities to solve new problems stems from the fact that problem solving is of the skills being considered foundational in education. For example, Trilling and Fadel (2009) classify problem solving among the 21st century skills. In addition, it is to be noted that the very essential point "of twenty-first century skills is the need to integrate, synthesize, and creatively apply content knowledge in novel situations" (Binkley, 2012, p. 25).

Q4: Helping students develop positive attitudes towards solving new and complex problems is:

(1) Not important □ (2) Somewhat important □

(3) Important □ (4) Very important □

Table 8. The importance of helping students to solve new problems

How Important is Helping Students to Solve New Problems?	Counts	Percentage	Valid percentage	Cumulative Percentage
Somewhat important	1	2.0	2.0	2.0
Important	15	30.0	30.0	32.0
Very important	34	68.0	68.0	100.0
Total	50	100.0	100.0	

It appears from the results displayed in Table 8 that 23 (46%) of the teachers see that 'helping students develop positive attitudes towards solving new and complex problems' is 'very important', 15 (30%) see the point as being 'important', one teacher (2%) answered with 'somewhat important', and no one answered with 'not important.' The findings yielded by this question reflect teachers' positive attitudes towards new and complex problems. However, the teachers' positive view about the use of new problem-solving tasks is not sufficient to allow their students make good achievements in EFL. This is because various factors influence students' achievements and performance, mainly the teaching and testing methods, the classroom setting, and the students' readiness and willingness to learn. The idea is that the complex nature of the teaching/learning process should be looked at closely and with great care.

Q5: What might be the benefits of implementing problem-solving tasks in classrooms?

Various benefits of implementing problem-solving tasks in EFL classrooms have been highlighted by the respondents. It is, nevertheless, important to categorize those benefits. First, there are tasks relating to the development of students' cognitive abilities in terms of critical, creative, and analytical thinking. In fact, set clearly, challenging problems may benefit the students at the cognitive stage in the sense that they incite them to think deeply. In other terms, the students are called on to generate new ideas and solutions that cannot be produced routinely. Second, there are problem-solving tasks that offer the students the opportunity to develop their language skills, namely reading and writing. Students find themselves compelled to read as much as possible to gather the information likely to be used in problem resolution. Besides, the students need to develop their writing abilities so that they be able to display their solutions convincingly. Third, the learners are given a chance to develop their behavioral competencies, such as self-management and self-expression. Indeed, teachers can get their students involved in problem-solving tasks requiring from them to manage their stress and anxiety, as well as express themselves appropriately, either through writing or speaking.

Moreover, the advantages involve the promotion of students' self-confidence, self-esteem, autonomy, independence and responsibility, as one of the respondents writes: "The learners will be self-reliant and autonomous; they can face difficult situations with strong self-confidence." All these have a direct impact on students' input and output. The more the students are confident, the more they are focused, and hence likely to multiply their chances to acquire knowledge successfully. The more the teachers ask their students to thoughtfully solve problems, the more the students' self-confidence, autonomy, and responsibility grow. Last but not least, one of the benefits of implementing problem solving–tasks in the classroom lies in the creation of an environment conducive to effective learning. One of the informants contends that the use of problem-solving tasks "renders the teaching/learning process more active and enjoyable. This permits learners to develop their own learning strategies, practice, and improve their critical thinking abilities."

In support of what has been said above about the benefits of problem-solving tasks in EFL classrooms, one should resort to what has been claimed by the informants; since the latter's arguments add value to the discussion. For instance, one of the teachers' responses is as follows: "Implementing problem-solving tasks enables learners to be independent and helps them to deal easily with real-situation problems. Additionally, one of the informants claims that problem-solving tasks can help to "Build students' autonomy; promote critical thinking; prepare students for real life, and form responsible citizens."

4.3 The Teaching of Problem Solving

Q1: Which of the following strategies do you think fit(s) best problem-solving? (You can choose more than one).

Table 9. The problem solving strategies the teachers use

The Strategies	Counts	Percentage	Valid Percentage	Cumulative Percentage
To use a solution to a similar problem to help in solving a new one.	37	45.7	45.7	45.7
To identify the "ends" you target and then figure out the "means" you will use to reach them.	36	44.4	44.4	90.1
To use heuristics (a heuristic is a general rule that is usually correct).	3	3.7	3.7	93.8
To use an algorithm	5	6.2	6.2	100.0

Remarks: (1) One participant did not answer the question. (2) The total count in the table is 81 because the respondents indicated that they use more than one strategy.

The results in Table 9 indicate that 37 (74%) of the participants use analogical problem solving, 36 (72%) of them use means-ends analysis, 3 (6%) use heuristics, and finally 5 (10%) of the respondents use algorithms. This implies that the teachers use problem solving strategies liable to facilitate the resolution of problems by students. For instance, analogical problem solving represents for the students an opportunity to make recourse to their background knowledge. This idea has been supported by Leighton and Sternberg (2003) who explain that "when you use the analogy approach in problem solving, you employ a solution to a similar, earlier problem to help in solving a new one" (cited in Matlin, 2009, p.366). In the case of means-ends analysis, the major role of the solver is to reduce the gap between the initial state and the final state by analyzing the problem (Sternberg, 2009).

Q2. How much do you care about the following?

(Put a cross (X) in the right box.)

Remark: In the table the letter 'p' stands for participant (s)

Table 10. Teachers' care about problem solving procedures

Teacher's Procedures	**A great deal**	**A lot**	**A moderate amount**	**A little**	**Not at all**	**No Answer**
1/ Organizing the teaching/learning process around problem solving-tasks.	16 p (32%)	20 p (40%)	11p (22%)	3 p(6%)	0 p (0%)	0 p (0%)
2/ Motivating students to solve problems actively and accurately.	22 p (44%)	18 p (36%)	6 p (12%)	0 p (0%)	0 p (0%)	4 p (8%)
3/ Teaching students how to divide problems into sub-problems.	10 p (20%)	19 p (38%)	13 p (26%)	6 p (12%)	2 p (4%)	0p (00%)

4/ Involving students in solving problems collaboratively.	20 p (40%)	18 p (36%)	8 p (16%)	3 p (6%)	0 p (0%)	1p (2%)
5/ Designing tasks students are typically required to perform in real-life situations.	23 p (46%)	18 p (6%)	4 p (8%)	4 p (8%)	1 p (2%)	0p (0%)

A method to measure the respondents' care about problem solving is possibly to ask them about the basic procedures that can be used in the field. The question asked involves six (6) procedures. As regards the first procedure 'organizing the teaching/learning process around problem-solving tasks', 16 (32%) of the respondents claim that they care a great deal about it, 20 (40%) of them a lot, 11 (22%) a moderate amount, and 3 (6%) care a little. As a result, it can be stated that the majority of the respondents give importance to the procedure. This procedure is likely to foster students' familiarity with problem solving and promote the quality of their solutions.

The main results about the second procedure 'motivating students to solve problems actively and accurately' reveal that 22 (36%) of the participants claim that they care a great deal about the procedure, 18 (36%) of them a lot, 6 (12%) a moderate amount. In this respect, it is worth mentioning that "motivation is a crucial aspect of teaching and learning" (Moreno, 2009, p. 328). Accordingly, if motivation is lacking in educational contexts, feelings of anxiety and stress may begin to take place.

The informants' attitudes towards the third procedure 'teaching students how to divide problems into sub-problems', are as follows: 10 (20%) of the participants care a great deal about it, 19 (38%) of them a lot and 13 (26%) a moderate amount. A large number of participants care about the strategy, and they consider that it is vital to develop it in the learners. In this vein, it is useful to refer to Benjamin Bloom (1947), who views this strategy as an essential step that students should go through to solve problems successfully. In addition, according to Whimbey and Lochhead (1999), dividing problems into sub-problems is one of the characteristics of good problem solvers.

Procedure four 'involving students in solving problems collaboratively' has received the following attitudes: 20 (40%) of the informants care a great deal about the procedure, 18 (36%) of them a lot, 8 (16%) a moderate amount, and 3 (6%) a little. The teachers' responses are positive, and this attitude may be due to the fact that they view collaborative problem solving as an essential principle of the Competency Based Approach to Language Teaching (CBALT). Besides, they consider that collaborative problem solving can undoubtedly help students to develop a large set of competencies, such as negotiation of meaning, critical thinking, communication, and mutual respect.

Finally, the responses related to procedure five 'designing tasks students are typically required to perform in real-life situations' indicate that most teachers feel the need to use authentic materials in the classroom: 23 (46%) of the participants care a great deal about it, 18 (36%) of them a lot, and 4 (8%) a moderate amount. Their attitudes show that they regard real-life situations in class as the best way to render the teaching/learning process more motivating and enjoyable and to foster the development of problem-solving skills to cope with situations outside the classroom.

Q3: How often do you ask your students to identify and understand problems before starting to solve them?

Table 11. The frequency of asking students to identify and understand problems

Frequency	Counts	Percentage	Valid Percentage	Cumulative Percentage
Very often	22	27.2	44.0	44.0
Often	11	13.6	22.0	66.0
Regularly	15	18.5	30.0	96.0
Rarely	2	2.5	4.0	100.0
Total	50	61.7	100.0	

The above Table indicates that 22 (44%) of the teachers very often ask their students to identify and understand problems before starting to solve them, 11 (22%) often do it, and 15 (30%) regularly do it. That is, almost all the respondents recognize the importance of problem identification and understanding. This has been highlighted by many authors such as Polya (1973), Bransford and Stein (1993), Carter (1988), and Hambrick and Engle (2003). Polya (1973), for instance, contends that "it is foolish to answer a question that you do not understand" (pp. xvii and 6).

4.4 Teachers' Implementation of Problem-Solving Tasks in the Classroom

*Q1. Would you please mention how often you do each of the following***?** (Put a cross (X) in the right box.)

The question investigates whether the tasks that teachers ask their students to do involve problem solving or not. To make things clearer, a set of tasks were proposed to the informants.

Remark: In the table the letter 'p' stands for participant (s)

Table 12. Teachers' implementation of problem solving in the classroom

Task Features I involve my students in:	Very often	Often	Regularly	Rarely	Never	No Answer
Generating, analyzing varied and new options.	8p (16%)	23p (46%)	12p (24%)	4p (8%)	1p (2%)	2p (4%)
Predicting, synthesizing, hypothesizing, and concluding.	9p (18%)	15p (30%)	15p (30%)	8p (16%)	0p (0%)	3p (6%)
Evaluating the credibility and significance of arguments, decisions, and reports.	2p (4%)	12p (24%)	20p (40%)	9p (18%)	5p (10%)	2p (4%)
Identifying the critical as opposed to noncritical aspects of knowledge.	2p (4%)	6p (12%)	10p (20%)	20p (40%)	6p (12%)	6p (12%
Constructing an accurate symbolic representation (e.g., a diagram, a chart) of the newly acquired knowledge.	8p (16%)	6p (12%)	18p (36%)	17p (34%)	0p (0%)	1p (2%)
Doing difficult tasks dealing with similarities and differences between things.	3p (6%)	8p (16%)	13p (26%)	17p (34%)	7p (14%)	2p (4%)
Comparing things and explaining how they are different or alike.	14p (28%)	12p (24%)	16p (32%)	5p (10%)	0p (00%)	3p (6%)
Classifying things into categories and justifying the classification.	7p (14%)	9p (18%)	15p (30%)	12p (24%)	1p (2%)	6p (12%)
Explaining why information is valid or not.	10p (20%)	17p (14%)	12p (24%)	7p (14%)	3p (6%)	1p (2%)

Identifying and explaining errors in conclusions drawn by people.	9p (18%)	13p (26%)	22p (24%)	4p (8%)	2p (4%)	0p (0%)
Constructing and explaining new generalizations of what they learned.	6p (12%)	19p (18%)	16p (32%)	7p (14%)	0p (0%)	2p (4%)
Identifying new applications of the language rules they have learned.	10p (20%)	17p (34%)	15p (30%)	4p (8%)	1p (2%)	3p (6%)
Demonstrating effective communication skills-both verbal and written - in various ways.	14p (28%)	19p (38%)	13p (26%)	4p (8%)	0p (0%)	0p (0%)
The final results	15.69%	27.04%	30.30%	18.15%	4%	4.76%

As it can be noticed the respondents claim that they involve their students in problem solving and this very often (15.69%), often (27.04%), or regularly (30.30%). However, some tasks are rarely assigned by the teachers. By way of illustration, 20 respondents (40%) rarely involve their students in "identifying the critical as opposed to noncritical aspects of knowledge." This kind of task belongs to level 3 of Marzano's Taxonomy, that is, analysis and, more specifically, classification. According to Marzano (2001), classification can be challenging when it is used as an analytical process.

The informants' responses reveal that the majority of the teachers care about "predicting, synthesizing, hypothesizing, and concluding." Indeed, 9 (18%) respondents very often involve their students in the tasks, 15 (%) of the participants answered with 'often', and the same number opted for 'regularly.' In Marzano's Taxonomy, the levels 'predicting', 'synthesizing', 'hypothesizing' and 'concluding' deal with analysis (level 3). In this context, it is useful to mention that *"analysis within the New taxonomy incorporates a variety of aspects of the three highest levels of Bloom's taxonomy"* (Marzano, 2001, pp. 44-45). The three highest levels of Bloom's (1956) Taxonomy involve: analysis, synthesis, and evaluation. In brief, it can be stated that the results of the last question of the questionnaire indicate that the teachers care about problem solving, and this 'very often', 'often,' or 'regularly.'

5. Discussion

The findings of the previous discussion reveal that the first hypothesis 'problem solving for the teachers is slightly important' has been rejected. Indeed, analysis of the data found that 32% of the participants strongly agreed that problem solving is a crucial aspect of the teaching/ learning process while half of them (50%) agreed. The informants responded positively to the statement: "There is no effective teaching/learning process without effective problem-solving tasks." The findings corroborate with what has been affirmed by Mayer and Wittrock (2009, p. 702) that "educators are interested in improving students' ability to solve problems."

In addition, the teachers' perceptions are in close agreement with Schunk (2012) who advocates that problem solving is one of the most important kinds of 'cognitive processing' in instruction. Furthermore, the teachers' views towards the importance of problem solving are in line with Carter's (1988: 554) assertion that problem solving is "a way of learning, of coming to knowledge." Teachers' positive attitudes towards problem solving should be taken into account by the Algerian authorities of education. In clearer terms, the authorities should provide the teachers with effective teaching materials in order to help them implement problem solving in the classrooms successfully.

The second hypothesis of the study stating that 'the teachers view the implementation of problem-solving tasks as being easy' has also been rejected. In fact, the analysis of the teachers' responses indicated that 36% of them viewed the implementation of problem-solving tasks in the classrooms as being difficult and 38% as slightly difficult. This might be due to the fact that problem-solving is a complex process. This idea can be backed by resorting to Mayer and Wittrock (2009) who argue that solving problems means to reason, make decisions, think critically and creatively. In

order to appropriately and actively involve students in such cognitive processes, the teachers ought to base their instructional practices on principles that are compatible with constructivism and competency-based language teaching. To clarify the point, students should be regularly challenged by problem-solving issues that trigger their deep understanding.

The third hypothesis of the study mentioned that there are many benefits of implementing problem solving in classrooms. According to the results, the main benefits the respondents mentioned include: the development of students' cognitive abilities, their autonomy, and the teaching practices. Accordingly, the third hypothesis of the study has been confirmed. The findings are in similar line with what Delisle (1997) writes in his book: *How to use problem-based learning in the classroom* about the advantages of problem-based learning. That latter is principally based on problem solving. Being aware of the benefits of implementing problem-solving tasks in EFL classes, the teachers' responsibility, thus, is to emphasize the teaching practices that are likely to make the benefits tangible and visible.

With regard to the last question of the study: Do the teachers teach and assess problem solving using appropriate strategies? The informants' answers suggested that the mostly used ones were analogical problem solving (74%) and means-ends analysis (72%). Such strategies are useful in that they can be used to solve many types of problems (Reed, 2007). Accordingly, the hypothesis 'the teachers do not use appropriate strategies to teach and assess problem solving' has been refuted.

About the implementation of problem solving tasks, the majority of the teachers claimed that they very often (15.69%), often (27.04%), or regularly (30.30%) did that. For example, the levels of predicting, synthesizing, hypothesizing, and concluding were implemented by 39 (78%) of the teachers and the level of evaluation by 34 (68%). Such findings are similar to those obtained by Sims (1969) that 'careful reading', 'selecting' and 'evaluating' are all foundational in problem solving.

6. Conclusion

The survey attempted to explore the teachers' views, their teaching, and assessment of problem solving in EFL classes. The results reached in the present research yielded important implications for instruction. Such implications help us generalize the findings to other EFL teachers in the Algerian Secondary Schools (Year Three) regarding the implementation of problem-solving tasks in the classroom. It is clear that the majority of the teachers expressed their positive attitudes towards problem solving in terms of its importance and the necessity to effectively and appropriately involve the students in solving new problems that tap into their creative abilities. On these grounds, it can be argued that the EFL teachers of third-year students in the Algerian Secondary Schools primarily understand much of what represents a good environment for teaching and assessing problem solving. This positive point needs to be taken into account by the stakeholders by providing the teachers with the necessary means that might facilitate to them their practices in problem solving.

This study can be considered significant for the teaching and assessment of problem solving in EFL classes as it helps get clear insights into the basic issues dealing with the appropriate strategies to be used for promoting students' problem solving abilities. The findings have important implications for pedagogical strategies that might promote problem solving in EFL contexts. There are, nevertheless, some limitations to the study as, for instance, the limited research tools. Further research might be carried out by making use of classroom observation to directly see and record the teachers' practices regarding the teaching and assessment of problem solving. The use of an interview may add value to the study as it enables the researcher get more information about the teachers' views towards problem solving. Moreover, the target population can be enlarged to include teachers from other regions in Algeria.

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Appendix

Questionnaire

The aim of this questionnaire is to investigate the EFL teachers' views and implementation of problem solving-tasks in SE3 (Secondary Education – Year Three) classes in Algeria. You are kindly invited to answer the questions and provide full statements when necessary. Your contribution will be highly valuable for the research work. All your answers will be kept anonymous. **Thank you very much for your help.**

Section One: General Information about the Participants

(Type **X** *next to the selected alternative.)*

1/ Professional Experience

How long have you been teaching English?

● Less than **5** years □ ● From **5** to **10** years □ ● More than **10** years □

2/ Professional Training

Have you ever received any professional training in English teaching?

Yes □ **No** □

If yes, would you specify the type of training?

……

3/ Academic degree

What is your academic degree?

1/ Licence □ 2/ Master □ 3/ Magister □ 4/ Doctorate □

Section Two: Teachers' Views about Problem Solving

1/ How difficult is the implementation of problem solving in the classroom?

(1) Very difficult □ (2) Difficult □ (3) Slightly difficult □

(4) Slightly easy □ (5) Easy □ (6) Very easy □

2/ "There is no effective teaching/learning process without effective problem solving tasks."

(1) Strongly agree □ (2) Agree □ (3) Partly agree □

(4) Slightly disagree □ (5) Disagree □ (6) Strongly disagree □

3/ "Assessing learners' abilities to solve new problems should be stressed by all teachers."

(1) Strongly agree □ (2) Agree □ (3) Partly agree □

(4) Slightly disagree □ (5) Disagree □ (6) Strongly disagree □

4/ Helping students develop positive attitudes towards solving new and complex problems is:

- Not important □ - Somewhat important □

- Important □ - Very important □

5/ According to you, what might be the benefits of implementing problem-solving tasks in classrooms?

……

……

……

Section Three: The Teaching of Problem Solving

1/ Which of the following strategies do you think fit(s) best problem-solving? (You can choose more than one).

■ To use a solution to a similar, earlier problem to help in solving a new one. □

■ To identify the "ends" you target and then figure out the "means" you will use to reach them . □

■ To use heuristics (a heuristic is a general rule that is usually correct). □

■ To use an algorithm (a method that will always produce a solution to the problem, although the process can sometimes be inefficient). □

2/ How much do you care about the following? (*Put a cross (X) in the right box.)*

Teacher's Procedures	**A great deal**	**A lot**	**A moderate amount**	**A little**	**Not at all**
Organizing the teaching/learning process around problem solving tasks.					
Motivating students to solve problems actively and accurately.					
Teaching students how to divide problems into sub-problems.					
Involving students in solving problems collaboratively.					
Designing tasks students are typically required to perform in real-life situations.					

3/ How often do you ask your students to identify and understand problems before starting to solve them?

Very often □ Often □ Regularly □

Rarely □ Never □

<u>Section Four</u>: Teachers' Implementation of Problem Solving in the Classroom

1/ Would you please mention how often you do each of the following? *(Put a cross (X) in the right box.)*

Task Features **I involve my students in:**	**Very often**	**Often**	**Regularly**	**Rarely**	**Never**
generating, analyzing varied and new options.					
planning for effective implementation of new solutions.					
gathering data by asking questions Who? What? Where? When? Why? and How?					
formulating problem statements which allow them to generate various options.					
examining, reviewing, selecting, and implementing the best options.					
predicting, synthesizing, hypothesizing, and concluding.					
evaluating the credibility and significance of arguments, decisions and reports.					

applying language rules though they do not necessarily understand the rules.					
identifying the critical as opposed to noncritical aspects of knowledge.					
constructing an accurate symbolic representation (e.g., a diagram, a chart) of the newly acquired knowledge.					
doing difficult tasks dealing with similarities and differences between things.					
comparing things and explaining how they are different or alike.					
classifying things into categories and justifying the classification.					
explaining why information is valid or not.					
identifying and explaining errors in conclusions drawn by people.					
constructing and explaining new generalizations of what they have learned.					
identifying new applications of the language rules they have learned.					
demonstrating effective communication skills- both verbal and written - in various ways.					