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Learning motivation and strategies of ESP university students

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Abstract

This paper deals with two of the key factors in the L2 learning process, namely, learning motivation and strategies. A group of engineering students from Bilbao (Spain) having a good command of English for General Purposes (EGP) and taking a course in English for Specific Purposes (ESP) are the basis of a study in which types of English Learning Motivation (ELM), i.e. intrinsic and extrinsic (integrative and instrumental) (Brown, 2000), and types of English Learning Strategies (ELSs), i.e. memory, cognitive, compensation, metacognitive, affective and social strategies (Oxford, 1990), are analysed. As expected, Instrumental ELM and Cognitive and Metacognitive ELSs are the most widely used by these learners. However, some striking and significant differences appear in connection with: 1) male vs female Intrinsic ELM and Social ELSs; 2) 21-23 vs 24-27 age group Instrumental (EGP) ELM, and Metacognitive and Social ELSs. Finally, with respect to the prospective correlation between ELM and ELS types, the results seem to confirm that there are significant correlations among most of them; e.g., Instrumental (ESP) ELM is positively and significantly correlated with all but Affective ELM.

Keywords: English Learning Motivation, English Learning Strategies, English for Specific Purposes (ESP), ESP courses, engineering students.

Resumen

El artículo se ocupa de dos de los factores clave en el proceso de aprendizaje de una segunda lengua, a saber, las estrategias y la motivación para aprenderla. Un grupo de estudiantes de ingeniería de Bilbao (España) que tienen un buen dominio del Inglés para Fines Generales (IFG) y que están recibiendo un curso de Inglés para Fines Específicos (IFE) es la base de un estudio en el que se analizan tipos de motivación para el aprendizaje del inglés (MAI), es decir,

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intrínseca y extrínseca (integradora e instrumental) (Brown, 2000), y tipos de estrategias de aprendizaje del inglés (EAI), es decir, se analizan estrategias relacionadas con la memoria, cognitivas, de compensación, metacognitivas, afectivas y sociales (Oxford, 1990). Como era de esperar, las más ampliamente utilizadas por estos alumnos son la MAI instrumental y las EAI cognitivas y metacognitivas. Sin embargo, se dan algunas diferencias llamativas y significativas relacionadas con: 1) La MAI intrínseca y las EAI sociales para varón vs hembra; 2) La MAI instrumental (IFG) y las EAI metacognitivas y sociales para los grupos de edad 21-23 vs 24-27. Finalmente, con respecto a la correlación entre tipos de MAI y de EAI, los resultados parecen confirmar que hay correlaciones significativas entre la mayoría de ellas; por ejemplo, la MAI instrumental (IFE) está positiva y significativamente correlacionada con todas las MAI excepto la afectiva.

Palabras clave: motivación para el aprendizaje del inglés, estrategias de aprendizaje del inglés, Inglés para Fines Específicos (IFE), cursos de IFE, estudiantes de ingeniería.

1. Introduction

The general principle that the learner needs to play an active role in the learning process (Horwitz, 1999) has become widely accepted. Taking this principle into account, the paper considers the premise that to learn a language effectively, several factors play a major role and, among those factors, the following two are analysed in this research work: English Learning Motivation (ELM) and English Learning Strategies (ELSs). Moreover, age is also collaterally considered since the learners that take part in the present study are engineering students who are taking a course in English for Specific Purposes (ESP) in the Faculty of Engineering in Bilbao (Spain).

The issues addressed in the paper include the ELM types shown by these learners and the ELS types used by them and their correlation in an ESP course. For this approach to be carried out, firstly, the theoretical underpinnings of key concepts are presented (e.g. learning motivation and strategies). Secondly, the instrument used to investigate is a questionnaire made up of items on ELM specifically designed for these engineering students and items on ELSs taken from Oxford (1990) [SILL - Strategy Inventory for Language Learning] but customized to suit our local features.

2. Some key issues on language learning motivation and strategies

2.1. Language Learning Motivation

Motivation is one of the key abstract affective variables of language learning (Bernaus et al., 2004; Bernaus & Gardner, 2008). Motivation is related to other

affective variables such as attitudes (Gardner, 2010; Kormos, 2008) and, according to some researchers, learners having a good language motivation and, for example, a positive attitude towards an L2 or L3 can learn it more successfully (Baker, 2006; Dörnyei & Ushioda, 2011). Other affective and non-affective variables such as anxiety and aptitude are also involved in language learning but this paper will focus exclusively on intrinsic and extrinsic motivation of language learners from a tertiary education setting within the field of engineering.

Motivation for language learning is said to be the psychological quality that leads learners to achieve the goal of mastering that language (Eagly & Chaiken, 2007). Language learning motivation (LLM) and its relationship with L2 learning achievement is one of the individual variables to which more attention is paid in language acquisition literature (Brewer & Burgess, 2005; Lasagabaster, 2011).

Researchers in many parts of the world have found that motivation is a consistently strong predictor of successful language learning, and that their correlation is largely positive (Masgoret & Gardner, 2003). However, several research studies carried out in different contexts have demonstrated that the strength of motivation to learn a language varies from language to language or even with age (Dewaele, 2005; Gardner & Tremblay, 1998), this leading to individual variations over time. In these studies, the oldest learners' motivation is less intense than that from the youngest ones, even when learning takes place in formal school settings.

Different types of motivation have been recorded over the years. The distinction between integrative and instrumental motivation (Gardner & Lambert, 1972) continues to be a valid taxonomy, but other categorizations, such as intrinsic versus extrinsic motivation, are also commonly used (Ryan & Deci, 2000a).

A modern approach to integrative motivation (Gardner, 2010) indicates that to describe an individual as being integratively motivated to learn a language, first of all, s/he will have to be highly motivated to learn it; secondly, s/he will have an open and accepting approach to the new cultural group and/or a strong emotional interest in the speakers of that language and, thirdly, s/he will have a positive evaluation of the learning situation.

Instrumental motivation refers to the pragmatic or potential utilitarian gains of L2 proficiency to achieve practical goals such as reading technical material, translation work or achieving higher social status (Norris-Holt, 2001).

The distinction between intrinsic motivation (motivation to engage in an activity for its own sake) and extrinsic motivation (motivation to engage in an activity as a means to an end) is also a well-known dichotomy (Pintrich & Schunk, 2002). However, the definition of intrinsic and extrinsic motivation has always been controversial (Sansone & Marackiewicz, 2000). Schmidt et al. (1996) defined extrinsic motivation as motivation to obtain an external reward and intrinsic motivation as motivation to get sufficient rewards from the activity itself or, in other words, when the individuals' motivational stimuli come from within. They stated that intrinsic-extrinsic distinction is similar to integrative-instrumental distinction, but not identical. According to them and other researchers, e.g. Brown (2000), both instrumental and integrative motivation can be seen as subtypes of extrinsic motivation, because both are related to goals and outcomes. To sum up, the students who have intrinsic motivation are inclined to face intricate problems and gain knowledge from their slips and mistakes (Walker et al., 2006), while the students who show extrinsic motivation take part in activities because of reasons not directly linked to the activity.

2.2. Language Learning Strategies

Several authors (Oxford, 1990; Cohen, 1998; Chamot, 2001) have suggested that learners in general might be able to learn a language more effectively by the use of language learning strategies (LLSs). In other words, LLSs have the potential to be "an extremely powerful learning tool" (O'Malley et al., 1985, p. 43). However, although the term 'strategy' has been used by prominent authors in the field (O'Malley et al., 1985; Oxford, 1990), it is rather controversial. Consequently, LLSs have been difficult to define (Cohen, 1998). Then, before proceeding with the research, a working definition of 'language learning strategy' will be necessary. Oxford (1990) defined LLSs as "specific actions taken by the learner to make learning easier, faster, more enjoyable, more self-directed, more effective, and more transferable to new situations" (p. 8). For the purpose of this study, LLSs will mean the specific actions employed by the learners for the purpose of accomplishing their language learning goals.

To choose the most appropriate strategies for the language learning process to be successful is considered a key aspect in L2 acquisition (Krashen, 2013) and one of the main factors accounting for differences in language learning (Skehan, 1989).

There are hundreds of different LLSs. Several researchers have developed detailed taxonomies (Oxford, 1990; O'Malley and Chamot, 1993; Valcárcel et al., 1996). Oxford (1990) firstly distinguishes between direct (memory, cognitive and compensation) and indirect (metacognity, affective and social) LLSs.

Gardner and MacIntyre (1993) proposed a model of language learning whereby LLSs interact in a complicated way with other individual factors such as intelligence, aptitude, attitudes, motivation and anxiety. Other possible learner variables which have the potential to affect the choice of LLSs might include personality, learning style, beliefs, personal circumstances, gender and age. For example, women are often believed to be better language learners than men (Larsen-Freeman & Long, 1991). Oxford (1990) suggests that "women use significantly more learning strategies than men and use them more often" and, as far as age is concerned, older learners appear to use more "sophisticated LLSs than younger learners" (p. 238).

Recent research (Rose, 2012) has examined LLSs in more context-specific situations. That is, when adult learners take an ESP course, for example, they are likely to deploy a different set of strategies than if they were to study grammar.

When learners use memory-related strategies, they arrange things in order or making associations. These strategies are extensively used in initial stages of language learning, but beyond a certain amount of stored vocabulary and structures, such strategies become less crucial in the language learning process (Oxford, 2003).

A learner uses cognitive strategies when s/he manipulates the language material in direct ways to improve learning. This involves the development of internal structures to enable the student perform complex tasks (Oxford & Green, 1996).

Metacognitive strategies ["higher order executive skills that may entail planning for, monitoring, or evaluating the success of a learning activity" (O'Malley and Chamot, 1993, p. 44)] are employed by learners to help them exercise 'executive control' on their learning process. In synthesis, metacognition refers to the ability of learners to be aware of their learning process and it can be understood as one part of the abilities that lead to student expertise.

Cognition and metacognition are related but they differ: cognitive skills are those needed to perform a task whereas metacognitive skills are necessary to

understand how it was performed (Rivers, 2001). Successful adult learners employ a wide range of metacognitive skills. Research indicates that learners who are aware of their abilities perform better than those who are unaware (Rivers, 2001). Then, metacognitive skills enable students to develop as independent learners by enabling them to become self-managers and appraisers of their own thinking and learning.

Compensatory strategies (e.g., guessing from the context) help the learner make up for missing knowledge and/or information in reading and writing. Some researchers (Dörnyei, 2005) have considered these strategies a sub-category of cognitive strategies.

Affective strategies, (e.g., talking about feelings), have also shown to be significantly related to L2 proficiency (Dreyer & Oxford, 1996) but not always (Oxford, 2003). The reason she suggests is that "over time there might be less need for affective strategies as learners progress to higher proficiency" (p. 14).

Social strategies (e.g., asking questions) help the learner work with others and understand the target culture as well as the language. According to Schmitt and Celce-Murcia (2002) "it is only through social interaction with others that humans develop their language and cognition" (p. 11). Recent research has connected affective and social strategies under the umbrela term self-regularion (Rose, 2012).

2.3. Relationship between LLM and LLS types

Oxford and Nyikos (1989) stated that LLM can be effective in predicting learners' use of strategies. According to them, students with stronger motivation are believed to use more LLSs than less motivated ones. LLSs, but specifically metacognitive strategies, seem to have a close relationship with learners' development of self-autonomy (Fleming & Walls, 1998). Bacon and Finnemann (1990) found a positive correlation between LLM (and attitude), and the LLSs used by university L2 students. Finally, according to Lan and Oxford (2003), LLM, LLSs and variables such as age are closely associated.

3. Research questions

ELM and ELSs have been widely researched into but after having carried out a thorough review of the literature on the topic, a context in which the group being studied is made up of experienced ESP course-takers has not been found. Based on this fact, the following questions are put forward in this study:

3.1. What types of ELM present these ESP students? Do these types of ELM change according to gender and/or age?

Due mainly to their close proximity to the labour market, instrumental motivation is expected to be the most widely spread type of ELM for these adult learners enrolled in an ESP course. No significant differences are expected according to changes in gender and/or age. We hypothesize that the ESP course will positively affect their instrumental motivation and, to a lesser extent, their intrinsic motivation, since the participants are senior major engineering students.

3.2. What kinds of ELSs are used by these ESP students and how frequently do they use them? Does the reported frequency of ELS use vary according to gender and/or age?

Adult learners have greater cognitive and linguistic capabilities, and conceptual complexity than younger learners (Robinson, 2005), but these capabilities may vary from learner to learner. Moreover, metacognition refers to the ability of learners to be aware of and monitor their learning process. Then, taking into account the age and circumstances in which the learning process takes place, what we expect from our second research question is that these learners will use mainly cognitive and metacognitive ELSs. In terms of frequency, we expect female learners to use significantly more learning strategies than men and to use them more often (Oxford, 1990). Finally, we expect not to find significant differences between the age groups considered.

3.3. To what extent do ELM and ELSs relate to each other in our ESP context?

For this last research question, we expect our traditional learning environment to play a basic role in engaging these learners and favouring their personal learning styles. In research work carried out by Clayton el al. (2010), significant differences appeared in motivational beliefs and learning strategies for students depending on whether they preferred traditional learning environments or not. Moreover, the former showed a mastery goal orientation and greater willingness to apply effort while learning.

4. Methodology

4.1. Participants

Two studies were carried out for this research work: a pilot study and a full-scale study. The former included Master students (N=19) [11 male vs 8 female; age range: 22-29 (M=24.6, SD=.42)] from the Faculty of Engineering in Bilbao (Spain) and the latter included senior major engineering students (N=208) [127 male vs 81 female; age range: 21-27 (M=23.3, SD=.63)] from the same Faculty. Two important points should be taken into account in terms of homogeneity. The first one refers to the Master's students, since most members of the sample had been previously senior major students from this Faculty. The second one refers to the learners from the full-scale study, since the overall sample was the sum of two smaller samples (97 students +111 students) chosen from students of two consecutive terms.

Finally, it should be emphasized that the participants had in common the following characteristics at the time this study was carried out: 1) they were taking an elective ESP course; 2) they were following simultaneously (or had followed previously) optional CLIL (Content and Language Integrated Learning) courses; 3) English is considered their L2 since they speak Basque and/or Spanish as their L1.

4.2. Instrument

The students were invited to complete a questionnaire assessing their motivation and strategies in relation to learning English. The questionnaire also required students to provide some socio-biographical information [age, gender].

A self-report questionnaire was chosen as the basic instrument because it is possible to use this kind of questionnaire to survey a fairly large number of participants (N=208 in our study) and because it is less dependent on the researcher's interpretation. According to Dörnyei (2003), in spite of the potential disadvantages, self-report questionnaires have the advantages of versatility, cost effectiveness and efficiency in terms of staff and student time and effort. Therefore, a questionnaire was chosen as the initial instrument for the current study since it could be used in its own right as a means of gathering interesting insights. It included several items connected to key learning motivators and strategies. The items in each section were presented in a

random order. The questionnaire was exclusively administered in English and the sections it contained were the following:

- Age, sex.

- Intrinsic and extrinsic (integrative-instrumental) motivation.

- Memory-related, cognitive, compensation, metacognitive, affective and social learning strategies.

The different scenarios usually contemplated for ELM are a combination of different levels of intrinsic and extrinsic motivation (Schmidt et al., 1996), the latter being divided into the dichotomy integrative vs instrumental, as Brown (2000) does. In order to quantify this diversity of options in our study, twenty items have been included in this section of the questionnaire, divided into different subsections. The first five items try to detect the level of intrinsic ELM our students show, and the following five try to see to what extent the learners have integrative feelings. Finally, ten new items try to check the levels of instrumental ELM of these students, both with respect to EGP (5 items) and ESP (5 items).

For the ELSs used by these engineering students to be checked, the SILL (Strategy Inventory for Language Learning) (Oxford, 1990) was used as a starting point. The 50 items of this instrument cannot be viewed uncritically since some of them are vague and therefore open to differing interpretations (especially by speakers of other languages), thereby possibly affecting reliability. Moreover, the items are decontextualised, learners' responses may vary according to the situation in which they envisage using the strategies. In spite of such difficulties, Oxford's taxonomy is possibly the most comprehensive currently available. To overcome all these prospective difficulties, an *ad-hoc* questionnaire was developed using the original from Oxford (1990) but considering local constraints. The original 50 items became 35 for the pilot study and just 23 for the full-scale study.

A 5-point Likert scale has been used because it is the most frequently used scale and because it may be usful for comparing purposes. Response options for ELM were assigned the following numbers for grading purposes: *strongly agree* = 5, *agree* = 4, *neither agree nor disagree* = 3, *disagree* = 2, *strongly disagree* = 1. Response options for ELSs were: *always or almost always* = 5, *often* = 4, *sometimes* = 3, *rarely/seldom* = 2, *never or almost never* = 1.

	Number of items	Cronbach's alpha
ELM		
Intrinsic	5	.902
Integrative	5	.726
Intrumental (EGP)	5	.857
Instrumental (ESP)	5	.919
ELS		
Memory	3	.685
Cognitive	5	.792
Compensation	4	.713
Metacognitive	4	.911
Affective	3	.662
Social	4	.751

Table 1. Reliability analysis for ELM and ELSs.

A reliability analysis was carried out to examine the scales of ELM and ELSs. The results of this analysis are summarized in Table 1, above. It can be observed that most values of Cronbach's alpha for items from the ELM and ELSs questionnaires were higher than .7 (only two of them are slightly lower). Consequently, it can be affirmed that the items (and the questionnaire) are reliable.

4.3. Procedure

4.3.1. Pilot study

Prior to the full-scale research project, a pilot study was carried out to test and adjust the full-scale study and thus improve the chances of a clear outcome. Master students from the Faculty of Engineering in Bilbao (Spain) took part in this study (N=19). The questionnaires were administered in the middle of the term and data collection took place immediately afterwords. The students who participated in this study had already taken the same ESP course one year earlier and were taking a new one.

Originally, the questionnaire contained 60 items (25 items on ELM and 35 items on ELSs). The questionnaires were completed in class (≤30 minutes) and the answers were recorded on answer sheets. They were also codified and

statistically analysed by means of the following statistical analysis and data management solution: SPSS Statistics.

4.3.2. Full-scale study

After the completion of the pilot study, an exploratory factor analysis was conducted to examine the factor structure of the items in the questionnaires. The results of this factor analysis led us to remove certain items included in the pilot questionnaire, since their discriminative power was null or very weak. Then, from the original 60 items, after carrying out the factor analysis, only 43 remained in the questionnaire (20 for ELM and 23 for ELSs). Apart from these 43 items, the students were also invited to provide answers to two more items connected with age and gender. The reshaped questionnaire was administered during a class by the end of the term (≤20 minutes).

4.4. Data analysis

After data collection, exploratory factor analyses with principal component analysis were used to examine the items of both ELM and ELSs. The Statistical Package for the Social Sciences (SPSS Windows version 15.0) was used. ELM and ELS items were examined for factor structure and Promax rotation was used to examine the results.

Once the exploratory factor analyses were carried out, the following step consisted on computing the correlation between the two variables, ELM and ELSs, via Pearson product-moment correlation analysis. Descriptive statistics including arithmetic means (m) and standard deviations (s) were also calculated to summarize the learners' responses to the questionnaire.

5. Results

5.1. English Learning Motivation

The part of the questionnaire containing ELM items was made up of three sections: intrinsic motivation, integrative motivation and instrumental motivation. For analysing differences (if any), the latter was divided into EGP and ESP. Table 2 shows m and s values for each type of ELM and for the ELM items included in the questionnaire. The results clearly show that the learners are, above all, instrumentally motivated. Moreover, the instrumentality of EGP seems to be very similar to that of ESP.

ELM types and items	m	s
Intrinsic	2.63	1.03
1. I like the English language	2.73	.68
2. I enjoy learning English very much	2.96	.73
3. I would rather learn English than any other language	1.87	1.21
4. I learn English simply for the sake of learning it	1.33	.99
5. I feel the need to speak proper English	4.28	.32
Integrative	2.44	.84
I study English because…		
6. I am interested in the culture, history or literature associated to the English-speaking world	1.63	1.12
7. I would not mind immigrating to a country where English is widely spoken	1.96	.63
8. I have a strong desire to know all aspects of this language	2.08	.88
9. I like to communicate with people who speak English	3.09	.76
10. I am determined to achieve maximum proficiency in English	3.48	.64
Instrumental (EGP)	3.91	.57
I study English because…		
11. I want to be able to speak this international language apart from my mother tongue (e.g. Basque and/or Spanish)	3.12	.70
12. to be fluent in English will help me to find a good/better job more easily	4.76	.29
13. I feel that good knowledge of English will give me an edge in competing with others	4.01	.40
14. it is the predominant language of almost 50 countries	3.14	.52
15. increasing my English proficiency will have financial benefits for me	4.53	.33
Instrumental (ESP)	3.97	.41
I take ESP courses because…		
16. most books from my reading list on engineering are written in English	3.86	.57
17. it is the main language of science, technology and academia	4.51	.36
18, most engineering literature I deal with is written in English	3.30	.49
19. it can allow me to be part of multidisciplinary and multicultural teams	3.63	.61
20. I would like to be fully proficient in the English used in engineering	4.54	.30

Table 2. m and s values for ELM types and items.

5.1.1. Factor Analysis

Exploratory Factor Analyses with Principal Component Analysis were used to test the factor structure of the motivation scale. A Promax rotation (k=4) with eigenvalue greater than 1 was used. The results showed a four-factor structure (see Table 3).

	Factor 1	Factor 2	Factor 3	Factor 4
Intrin1	.884			
Intrin2	.701			
Intrin3	.608			
Intrin4	.706			
Intrin5	.823			
Integr1		.786		
Integr2		.814		
Integr3		.689		
Integr4		.674		
Integr5		.521		

InstrG1	.537	
InstrG2	.934	
InstrG3	.745	
InstrG4	.827	
InstrG5	.699	
InstrS1		.823
InstrS2		.910
InstrS3		.849
InstrS4		.798
InstrS5		.756

Intrin=intrinsic motivation; Integr=integrative motivation; InstrG= instrumental motivation (EGP); InstrS= instrumental motivation (ESP)
Extraction method: Principal Component Analysis
Rotation method: Promax with Kaiser's normalization

Table 3. Matrix for factor analysis of ELM

Factor 1 (intrinsic motivation): The items of intrinsic motivation load heavily, ranging from .608 to .884. This factor reflects the features of individuals who have the desire to perform a specific task in English due to the perceived intrinsic value and enjoyment derived from the activity.

Factor 2 (integrative motivation): The items of integrative motivation load from .521 to .814. This factor represents the positive attitudes and feelings towards the English speaking group and/or the desire to be integrated into the culture of this language group.

Factors 3 and 4 (instrumental motivation of EGP and ESP): The items load from .537 to .934 for EGP, and from .756 to .910 for ESP. This factor represents the instrumentality of English as a means to get a better job or a higher salary by learning the language (EGP and/or ESP) as an instrument.

5.1.2. Correlation matrix for ELM types

In order to investigate the relationship between the types of ELM, Pearson product-moment correlation analysis was used. Table 4 shows the r values (Pearson's product-moment correlation coefficients) of the different types of ELM to see how they are correlated to each other.

	Intrin	Integr	InstrG
Integr	.148*	---	
InstrG	.269**	.202**	---
InstrS	-.196**	.246**	.360**

* Significant correlation at the .05 level
** Significant correlation at the .01 level

Table 4. r values for the different types of ELM.

As shown in Table 4, the ELM types significantly and positively correlated are: Intrin/InstrG, Integr/InstrG, Integr/InstrS and InstrG/InstrS at the .01 level and Intrin/Integr at the .05 level. Finally, Intrin ELM and InstrS ELM are significantly but negatively correlated (r=-.196) at the .01 level.

5.1.3. Gender, age and ELM types

To determine if the two sets of data, male vs female and 21-23 age range vs 24-27 age range, are significantly different from each other, *t*-tests were carried out. Despite the fact that the normality hypothesis is not fulfilled, the test can be used because the samples are fairly high and there are no important differences in their variances. Before continuing, it must be justified the grouping made for the variable "age". It was intended to have two groups with, more or less, a similar number of individuals. The groups 21-23 and 24-27 gave us the most adequate division.

|	**Male** (N=127)		**Female** (N=81)				**21-23** (N=115)		**24-27** (N=93)			
ELM	m	s	m	s	*t*	Sig	m	s	m	s	*t*	Sig
Intrin	2.55	.81	2.74	.63	.986	.027*	2.43	.79	2.86	.93	.845	.658
Integr	2.33	1.20	2.60	.78	1.279	.348	2.52	1.05	2.43	.58	1.856	.247
InstrG	3.95	.62	3.84	.61	2.306	.429	3.74	.74	4.11	1.21	-.652	.012*
InstrS	4.12	.54	3.73	.66	-.839	.126	4.01	.63	3.91	.53	1.116	.477

* $p < .05$

Table 5. Gender, age and ELM types.

The results of the tests (Table 5) show that the difference in the dichotomy male/female is significant when the focus is on Intrinsic ELM, and the difference in the dichotomy 21-23/24-27 age ranges is significant when the focus is on Instrumental (EGP) ELM.

Graph 1 and Graph 2 depict the dichotomies M vs F and 21-23 vs 24-27 for ELM. The ones with statistically significant differences have been specifically emphasized.
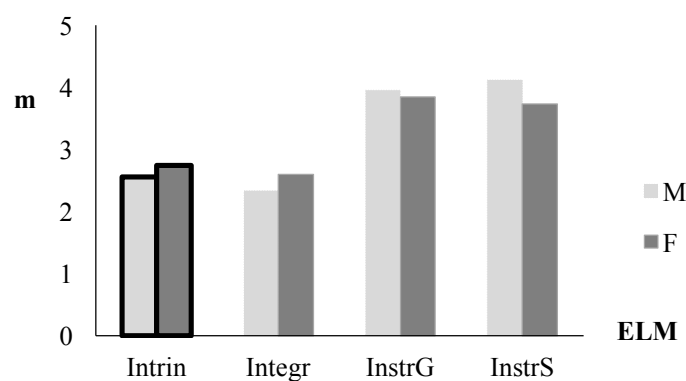
Graph 1. Mean value (m) distribution for gender and ELM types.
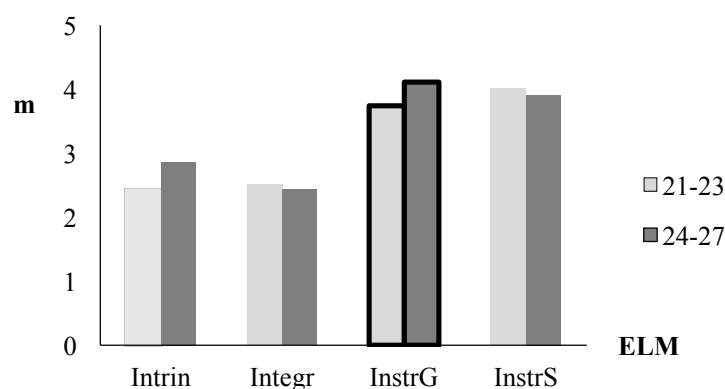
Graph 2. Mean value (m) distribution for age groups and ELM types.

5.2. English Learning Strategies

The part of the questionnaire containing ELS items was made up of six sections: memory, cognitive, compensation, metacognitive, affective and social, despite the fact that memory ELSs are a sub-category of cognitive ELSs for some researchers (Dörnyei, 2005). Table 6 shows m and s values for each type of ELS and for the ELS items included in the questionnaire.

The results show that these learners use mainly "Metacognitive" and "Cognitive" ELSs. However, they also use, at a lesser extent, "Compensation", "Social" and "Memory-related" ELSs. As far as "Affective" ELSs are concerned, it can be stated that these students make a weak use of them.

ELS types and items	m	s
Memory	2.82	.61
1. I think of relationships between what I already know from my content courses and new things I learn in my ESP course.	3.06	1.12
2. I try to use new words I learn in my ESP course in new sentences so I can remember them.	2.78	.77
3. I review my ESP lessons often.	2.63	.53
Cognitive	3.60	.72
4. I say or write the new technical/scientific words I learn several times.	3.37	.75
5. I try to imitate the sounds and entonation patterns used by native English speakers.	3.86	.88
6. I often watch TV programmes (e.g. Megafactories from Discovery MAX) or YouTube videos (e.g. Properties of Engineering Materials) suggested by my ESP teacher.	3.49	.59
7. I prefer reading books written in English from the reading lists of my content courses.	3.23	.79
8. I try not to translate word-for-word when we deal with new topics in my ESP course.	4.06	.46
Compensation	3.28	1.09
9. To understand unfamiliar English words, I make guesses.	3.12	.73
10. When I can' t think of a word during a conversation in English, I use gestures.	2.13	1.20
11. I read English without looking up every new word I come across.	3.87	.37
12. If I can' t think of an English word, I try to use a word or phrase that means the same thing.	4.01	.29
Metacognitive	3.75	.66
13. I try to find as many ways as I can to use my English.	2.86	.79
14. I pay attention when someone is speaking English.	4.31	.34
15. I plan my schedule so I will have enough time to study English.	3.88	.47
16. I have clear goals for improving my English skills.	3.97	.39
Affective	1.62	1.14
17. I try to relax whenever I feel afraid of using English.	1.41	.76
18. I encourage myself to speak English even when I am afraid of making a mistake.	2.19	.62
19. I reward myself whenever I perform well in my ESP lessons.	1.28	.42
Social	3.14	1.04
20. If I do not understand something, I ask the other person to slow down or say it again.	3.76	.89
21. I practice English with other students by discussing new topics at greater length.	2.78	.65
22. I ask questions in English to my classmates when in the ESP class.	3.98	.42
23. I try to explore the cultural and social norms of English speakers.	2.04	.72

Table 6. m and s values for ELS types and items.

5.2.1. Factor Analysis

Similar exploratory Factor Analyses to those carried out to test the factor structure of the ELM scale were accomplished for the ELSs scale. The results showed the following factor structure (see Table 7).

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
Mem1	.548					
Mem2	.659					
Mem3	.783					
Cognit1		.499				
Cognit2		.874				
Cognit3		.921				
Cognit4		.878				
Cognit5		.798				
Compen1			.689			
Compen2			.743			
Compen3			.821			
Compen4			.489			
Metacog1				.786		
Metacog2				.845		
Metacog3				.788		
Metacog4				.935		
Affect1					.678	
Affect2					.621	
Affect3					.498	
Social1						.823
Social2						.634
Social3						.478
Social4						.521

Strategies: Mem=memory; Cognit=cognitive; Compen= compensation;
Metacog= metacognitive; Affect=affective; Social=social
Extraction method: Principal Component Analysis
Rotation method: Promax with Kaiser Normalization

Table 7. Matrix for factor analysis of ELSs.

Factor 1 (Memory-related strategies): The loads of the items of this type of strategies range from .548 to .783. The factor represents the mental associations made by these learners to store vocabulary and retrieve words when needed for communication.

Factor 2 (Cognitive): The loads of these items vary importantly from .499 to .921. This factor reflects the ways these learners deal with the language, such as through reasoning, analysis, note-taking, summarizing, synthesizing, outlining, reorganizing information to develop stronger knowledge structures, practicing in naturalistic settings, and practicing structures and sounds formally.

Factor 3 (Compensation): The loads range from .489 to .821. What the factor represents is to what extent these learners use strategies such as guessing from the context in listening and reading; using synonyms and "talking around" the missing word to aid speaking and writing; and strictly for speaking, using gestures or pause words.

Factor 4 (Metacognitive): The items of metacognitive strategies load heavily from .786 to .935. The factor reflects the features of these learners in terms of strategies such as identifying one's own learning style preferences and needs, plannig for an L2 task, gathering and organizing materials, arranging a study space and a schedule, monitoring mistakes, and evaluating task success and their own learning success.

Factor 5 (Affective): The items' loads range from .498 to .678. The factor refers to the extent these learners talk about their feelings and reward themselves for good performance.

Factor 6 (Social): The items of this kind of strategy load from .478 to .823. The factor represents the amount of questions asked by these learners for verification, clarification of a confusing point and help in doing a language task, as well as talking with a native-speaking conversation partner, and exploring cultural and social norms.

5.2.2. Correlation matrix for types of ELSs

In order to investigate the relationship between the types of ELS, Pearson product-moment correlation analysis was used. Table 8 shows how the different types of ELS are correlated to each other.

	Mem	Cognit	Compen	Metacog	Affect
Cognit	.179**	---			
Compen	.401**	.356**	---		
Metacog	.312**	-	.432**	---	
Affect	.289*	.321**	.501**	.478**	---
Social	.188**	.248**	.389*	-.255**	-
		.199**			.318**

* Significant correlation at the 0.05 level
** Significant correlation at the 0.01 level

Table 8. Correlation between ELS types.

The ELSs positively and significantly correlated at the .01 level are (see Table 8): Mem/Cognit, Mem/Compen, Mem/Metacog, Mem/Social, Cognit/Compen, Cognit/Affect, Cognit/Social, Compen/Metacog, Compen/Affect and

Metacog/Affect. The positively and significantly correlated ELSs but at the .05 level are: Mem/Affect and Compen/Social. Finally, Cognit/Metacog (r=-.321), Metacog/Social (r=-.255) and Affect/Social (r=-.318) ELSs are negatively and significantly correlated at the .05 level.
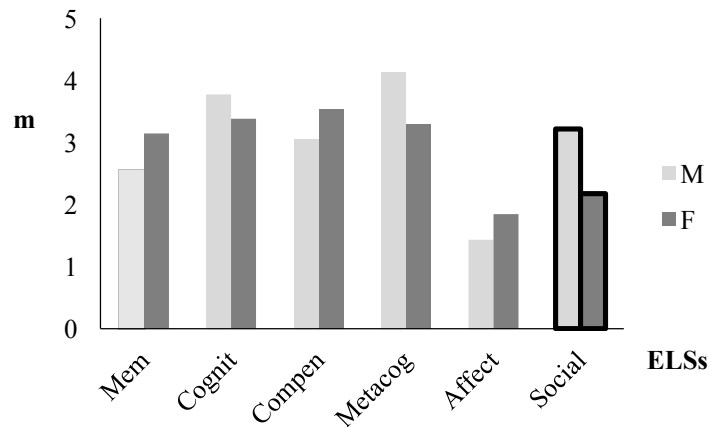
5.2.3. Gender, age and ELS types

New *t*-tests were conducted to check prospective differences between the groups of learners, i.e. male vs female and 21-23 age range vs 24-27 age range, in terms of use of ELSs. Table 9 includes the results of the tests and it can be stated that there are some statistically significant differences on the use of ELSs according to these learners' gender and age. On the one hand, the difference between male vs female learners is statistically significant in terms of use of "Social" ELSs. On the other hand, the differences are also statistically significant between the two age groups, 21-23 vs 24-27, in the use of "Metacognitive" and "Social" ELSs.

| ELSs	Male (N=127)		Female (N=81)				21-23 (N=115)		24-27 (N=93)			
	m	s	m	s	t	Sig	m	s	m	s	t	Sig
Mem	2.68	1.02	3.03	.59	-.126	.467	2.55	.88	3.14	.80	.332	.389
Cognit	3.44	.66	3.84	.69	.430	.623	3.77	.62	3.38	.84	.412	.522
Compen	3.17	.58	3.42	.72	-1.003	.398	3.05	.81	3.53	.69	-.129	.466
Metacog	3.57	.72	4.03	.40	.293	.502	4.12	.39	3.29	.43	.602	.036*
Affect	1.82	.39	1.30	.97	.348	.543	1.43	1.56	1.84	.73	.389	.255
Social	3.44	.59	1.66	.65	.412	.029*	3.21	.79	2.17	.92	.628	.048*

* p < .05

Table 9. Gender, age and ELS types.

Graph 3 and Graph 4 depict the dichotomies M vs F and 21-23 vs 24-27 for ELSs. The ones with statistically significant differences have been specifically emphasized.

Graph 3. Mean value (m) distribution for gender and ELS types.
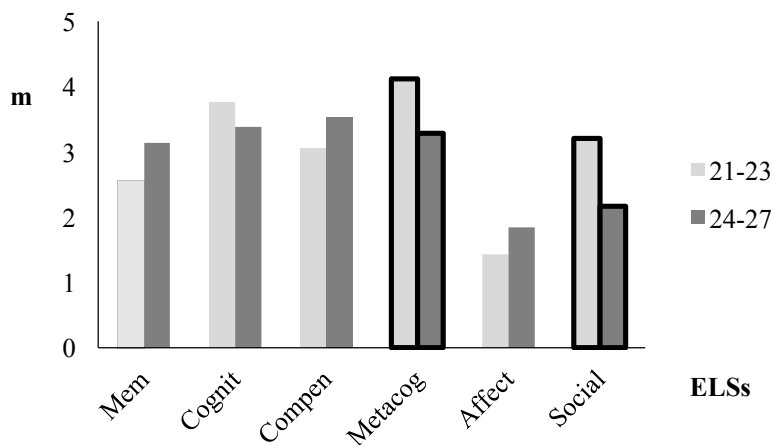
Graph 4. Mean value (m) distribution for age groups and ELS types.

5.3. Correlation between ELM and ELS types

Table 10 summarizes the results of the relationship between ELM and ELSs after using a Pearson's product-moment correlation analysis. The table includes the r values for ELM and ELS types.

	Intrin	Integr	InstrG	InstrS
Mem			-.269**	.423**
Cognit	.297**	.192**	.286**	.386**
Compen	.439**			.320**
Metacog	.390**	.249**	.421**	.434**
Affect	.243**			
Social			.299*	.366**

* Correlation significant at the .05 level (2-tailed)
** Correlation significant at the .01 level (2-tailed)

Table 10. r values for ELM and ELS types.

These results show that Intrinsic ELM is positively and significantly correlated to all but Memory and Social ELSs at the .01 level. As far as Integrative ELM is concerned, it is only positively and significantly correlated to Cognitive and Metacognitive ELSs at the .01 level. Instrumental (EGP) ELM is significantly correlated to all ELSs but Compensation and Affective. This correlation is negative for Memory ELSs (r=-.269), and positive but at the .05 level for Social ELSs. Finally, Instrumental (ESP) ELM is significantly and positively correlated to all but Affective ELSs at the .01 level.

Among the types of ELM depicted in this research work, Intrumental (EGP) ELM is especially highly and positively correlated with "Matacognitive" ELSs, whereas Intrumental (ESP) ELM is also highly and positively correlated to all but "Affective" ELSs. The correlations with "Metacognitive" (r=.434) and "Memory-related" (r=.423) ELSs are oustandingly high, but those affecting "Cognitive" (r=.386), "Social" (r=.366) and, to a lesser extent, "Compensation" (r=.320) ELSs can also be considered fairly high. These results also show that learners with stronger Instrumental (ESP) ELM tend to use more learning strategies. In fact, all but the "Affective" ones.

5.4. Answers to research questions

The answer to the first research question is quite straightforward. These learners show mainly Instrumental ELM, but the differences between the two age groups are statistically significant when we refer to Instrumental (EGP) ELM. Apart from this, the differences between male and female learners are also statistically significant when Intrinsic ELM is evaluated.

As far as the second research question is concerned, these learners make mainly use of Metacognitive and Cognitive ELSs and, to a lesser extent, Compensation, Social and Memory ELSs. The least used ELSs are the Affective ones. According to gender, only the differences in Metacognitive ELSs are

statistically significant. Female learners' use of Metacognitive ELSs differs significantly from those used by male learners.

The last research question expects to decipher the relatioship, if any, between ELM and ELSs. It is observed that there is a strong correlation between Instrumental (ESP) ELM and all but Affective ELSs. Intrinsic ELM is also strongly correlated to several ELM types (all but Memory and Social ELSs), as well as Intrumental (EGP) ELM (all but Compensation and Affective ELSs). However, Instrumental (EGP) ELM is negatively correlated to Memory ELSs. In the case of Integrative ELM, it can be stated that correlation only appears in connection with Cognitive and Metacognitive ELSs.

6. Conclusion

The results of the study partly support hypothesis number one. Firstly, as expected, these learners show mainly Instrumental ELM, which seems to indicate that the ESP course they are receiving helps to bolster its inherent instrumentality and to have a positive impact on their Instrumental ELM. Moreover, this type of ELM, both with respect to EGP and ESP, obtained much higher scores than the other two types of ELM included in this study, i.e. Intrinsic and Integrative ELM. On the one hand, this fact could be due to these learners' concern about the career advantages that English proficiency can give them, which confirms that this type of motivation is directly relevant for adult learners (Csizér and Dörnyei, 2005). On the other hand, young learners usually show greater intrinsic motivation than extrinsic towards language learning, but this combination changes as learners become older. Then, as we hypothesized and predicted, our learners, being adult and experienced ESP learners, proved to show greater Extrinsic ELM (as a whole, that is, Integrative + Instrumental ELM) than Intrinsic ELM. This is in line with what Ryan and Deci (2000b) point out, intrinsic motivation decreases when learners go up in the educational ladder. They also affirm that when intrinsic motivation is high, extrinsic motivation tends to be low, and when the latter increases the former decreases. Nevertheless, even though the mean for Intrinsic ELM was not particularly high (2.63), it should be pointed out that item number 5 in the questionnaire, "I feel the need to speak proper English", obtained an outstandingly high mean value (4.28). In line with this result, it should also be mentioned that despite the fact that the mean value for Integrative ELM was the lowest (2.44), one of its items, number 10 "I am determined to achieve maximum proficiency in English" also had a fairly high score (3.48).

Secondly, as far as gender and age are concerned, no significant differences were expected in our first hypothesis. However, there are significant differences between the male and female clusters when Intrinsic ELM is evaluated (p=.027) and between both age groups (21-23 vs 24-27) when Instrumental (EGP) ELM is considered (p=.012). These differences are rather striking and we do not have an explanation for that. Then, this is an issue that deserves further research and, consequently, future research work for similar contexts of ESP learners might include new hypotheses such as "Intrinsic ELM will differ depending on gender" and "Instrumental (EGP) ELM will differ depending on age range". Moreover, some more elaborate items might be included in the questionnaire containing ELM items in order to detect the reason(s) for these differences.

In our second hypothesis, we expect learners to use mainly cognitive and metacognitive ELSs, and the results obtained seem to support this hypothesis. However, it is worth mentioning that other ELSs such as Compensation, Social, and at a lesser extent Memory ELSs, are also frequently used. The least frequently used ELS is the Affective one. When interpreting this, we should conclude that these learners use a wide variety of ELSs but, mainly due to their age, they use less frequently the so-called Affective ELSs.

In terms of gender and age, our second hypothesis only expected female learners to use significantly more learning ELSs than men and to use them more often (Oxford, 1990). The results did not quite meet our expectations since there are significant differences between: a) male vs female learners only when they use Social ELSs (p=.029); b) age groups when they use Metacognitive (p=.036) and Social (p=.048) ELSs.

For hypothesis number three, in line with Bacon and Finnemann (1990), we expected ELM and ELSs to be correlated and our learners to prefer traditional learning environments. The correlations gathered in Table 10 confirm this hypothesis. In fact, the type of ELM most widely used by these learners, Instrumental, is significantly and positively correlated with all but Affective ELSs. On the contrary, Integrative ELM is only positively and significantly correlated with Cognitive and Metacognitive ELSs.

7. Final considerations

Language learners are "not mere sponges" (Chamot, 1987, p. 82), they make use of a variety of resources and/or strategies in order to achieve their linguistic goals, and motivation (Csizér and Dörnyei, 2005) provides the driving

force to sustain the long and often tedious learning process. This approach has implications for learning a foreign language in that the learner develops self-maturity.

The findings of Liyanage and Bartlett (2013) unequivocally support the existence of a relationship between the ELSs used in the acquisition process and the personality types of the learners. Taking this into account and the fact that the ELSs used by learners may or may not be compatible with the teaching styles of a course instructor, it is obvious that differences among learners will appear. Members of the former group, compatible, will retain information longer, apply it more effectively, learn more, and have a more positive attitude towards the course and the instructor. We firmly believe that adult learners in higher education can be coached to reflect on their internal thought processes and develop metacognitive skills that can be used to consciously manage their own learning.

One of the most relevant conclusions of studies on learners' motivation is again that instructors are one of the most determinant factors. Some studies (e.g., Sakai & Kikuchi, 2009) propose that L2 teachers play one of the most influential roles to help students engage and persist in the long process of language acquisition. These studies show that teacher-related factors can be categorized into two main components: (a) teaching materials and methodology, (b) instructor personality and the way s/he interacts with the learners.

In our particular context, we fully agree with this first component, teaching materials and methodology, since this is one of the key factors for success in an ESP course. One of the most important issues regarding ESP, materials selection and/or writing, is whether those materials should be solely or primarily subject specific and what the most appropriate ratio of general materials to subject-specific materials is. When carefully selected, both general and subject-specific materials will equip the students with the necessary skills and knowledge, but subject-specific materials nevertheless better cater for ESP learners' specific needs. Consequently, ESP learners often feel more affinity for materials that they find relevant to their area of speciality. In our study, the instrumental component of motivation in connection with EGP and ESP are strikingly similar.

The second component, instructor personality and the way s/he interacts with the learners, is also necessary for the learning process to be fully successful. If we already know that our learners have an instrumental orientation, a greater impact on our language learners could be achieved by wisely interacting with

them (Dörnyei and Ushioda, 2011). The development of programmes which maintain students' interest and have obtainable short term goals might be key tools for enhancing, or at least maintaining, their instrumental orientation.

The results of this study indicate that these proficient learners report frequent use of a large number of ELSs and these strategies enable them to work consciously on their vocabulary and to interact frequently with others in English. They report using strategies relating to reading and strategies (such as avoiding literal translation) which facilitate the tolerance of ambiguity. They seem to have effective techniques for understanding the systems of the new language (for instance, by looking for relationships and patterns and by trying to imitate sounds and intonation patterns used by native English speakers). Moreover, they seem to be able to manage their feelings and remain relaxed and positive without feeling the necessity of using Affective ELSs. These learners also report the use of strategies which enable them to manage their own learning and to utilise effectively available resources such as certain TV programmes.

The correlations between the reported frequency of some types of ELM and ELSs are moderate but statistically significant, so they provide enough support to justify further exploration of their relationship. I am conscious of the fact that the findings obtained in this study require broader empirical verification, especially the ones related to teachers' personalities and ways of teaching affecting learners' motivation. Items such as "My instructor's personaly helps me increase my motivation" or "The way my instructor interacts with us helps me increase my motivation" could be used as a separate set of the original questionnaire.

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