

Learning Variables and Individual Differences in Student-Centred Learning

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Abstract. The need to focus teaching and the learning activities of a foreign language on the student demands a greater attention to be paid to those learning strategies, which would lead to a more effective communication as well as a clearer orientation of the teacher's instructional design with respect to the individual differences among the class students. The paper aims at identifying variables that affect learning in order to produce more informed, educated and self-aware learners capable of adapting to any style of instruction and improving their own present and future language learning practices. In our experimental work carried out within Technical University of Cluj-Napoca we used methods that are believed to have a substantial impact on learning. The questionnaires we applied to our engineering students at different study levels were conceived with the purpose to see the way they perceive their learning strategies, the way they apply them, whether/how deep they are aware of their passing on towards specific communication strategies in the foreign language. The follow-up activities accomplished at different times within our research project allowed us to collect data relevant for the proposed aim, and made it possible to establish several learning variables, including learning and communication strategies, contributing to the student's decision to take on the learning of a foreign language. The paper highlights the fact that the engineering students elaborate their own syllabus, which they do not always observe, mirroring their learning effort while performing in English. The individual differences are determined by the students' previous experience in learning a language, the level of knowledge of their mother tongue, personality traits, attitudes and motivation, level of intelligence, learning style, strategies applied, and sociological preferences. The individual differences which constitute variables to be considered in a student-centred learning approach are interrelated and influence the progress rate, performance and learning quality positively or negatively.

Keywords: individual differences, learning strategies, communication strategies, student-centred learning

INTRODUCTION

Though major changes have occurred in the teaching methods, there are still education-related decision-makers who believe that learning depends primarily on the teacher who is responsible for what is taught, how it is taught, when it is taught, and how learner's performance is measured. However, current educational theory argues for a learner-centred rather than a teacher-centred approach, which is supposed to produce more educated learners adaptable to various learning environments, who can adjust their personal needs of learning to the changing demands of the global technological society. Recent environments based on new technology developments can organize interrelated learning themes into meaningful contexts, often in the form of a problem to be solved or activities to be fulfilled. Computer-enhanced learning environments "promote engagement through student-centred learning activities" (Hannafin, 1992) not only in their professional fields, but also in learning languages.

The student-centred approach thus has become an essential component in the teaching and learning of foreign languages in general, and of Languages for Specific Purposes (LSP) especially, in our case English for Specific Purposes (ESP). Learning a foreign language means reflecting on large volumes of material, being able to adapt to situations and

contexts, and also selecting what is really needed to know and what can be used to solve real-life problems. Looking for effective teaching and learning methods, teachers of ESP have revitalized interest in alternative teaching and learning perspectives, comparing traditional directed-teaching methods to learner-centred approaches, with a critical eye. Direct methods have been criticized for failing to emphasize practical problem solving and critical thinking, and for performance deficiencies due to oversimplified, and often superficial, language taught.

The orientation towards the learner represents, then, an essential element in teaching and learning ESP especially today when ESP courses in universities are seen as answers to the students' professional and academic requirements. Young people who choose careers in engineering tend to give much importance to personal autonomy. When becoming engineering undergraduates, it is important to them to believe that their own learning needs and preferences have also been taken into account. Respect for learners should manifest in attempts to orient instruction towards their own particular needs and abilities as well. Such an approach makes the relevance of the material obvious, because learners themselves select it. As a result, students seem to learn more effectively in an environment where they participate and collaborate with one another in the learning process.

The concept of student-centred learning emphasizes the concept of individual development, which points out that, in spite of having equal opportunities, learners come to show large differences in performance at the end of a course. Studies in the domain have been made to see whether all students in a group offered the same opportunities in the same amount of time would produce the same results. However, there is no clear result in the way in which individual differences, motivation, self-esteem, personality and learning styles are the reason of the differences found.

The present paper makes an attempt to identify some of the effective factors that are not linguistic in nature and which can contribute to enhancing learning a foreign language in the context of a student-centred approach implemented in the language class at the Technical University of Cluj-Napoca. Variables that affect ESP learning are discussed as they result from a comparative study of the variables for a number of over 400 students in engineering taken in our research experiment situated at a distance in time of 15 years. Other aspects our study focuses upon are the learning strategies and the communication strategies used and/or preferred by our learners. Some additional characteristics without which the foreign language learning process cannot take place are also underlined.

MATERIALS AND METHODS

In the learner-centred models we applied, the main focus was on the relation between learning and motivation with the clear purpose to improve instruction, in our case in the Technical University, in order to enhance the learning of engineering students in the foreign language class. The main concepts of learner-centredness, self-regulation in learning control (Pintrich, 1995) and self-determination in motivation (Deci *et al.*, 1991), which militate for personal responsibility of students' learning accomplishments, constituted the frame for our experimental work. Active control by the learner and the motivational value of that control – known as strategic learning – were also considered.

1. Conditions for student-centred education

When implementing our approach to the language class we started from the premises that language knowledge level differences are not decisive factors in students' performances in different ESP situations. There are other factors or variables that make the learning happen and contribute successfully to the proposed instructional approach.

a. The intelligence correlated with the learning ability

Though we did not develop research regarding intelligence level and its relation to improved ESP acquisition, we agree with the opinions expressed by Gardner and Lambert (1972) who have demonstrated the presence of a relationship between academic and intellectual capabilities of the learners. At the same time, we agree with the fact that the question why some people respond better to learning by solving a problem while others can learn better if rules are explained first to them still remains.

b. Psychological and personality factors

Personality factors greatly influence students' direct participation in communication. "Some students are not restricted by their level of language knowledge and speak, even with mistakes, when they need to address a question/statement/opinion/request to the teacher. Others, more emotional want to avoid the possibility of being criticized or appear ridiculous, do not want to risk making language mistakes and prefer not speaking. There is always a third category of students who are passive never having anything to say. The student will leave a conversation or give up a discussion if s/he will be interrupted too often, and corrected all the time" (Lierat, 2004 : 34).

c. Tolerance and empathy

Tolerance and empathy (Littlewood, 1984) help personalities better adapt to the situation of communication. The current observation of the groups formed for the instructional activities allowed us find that the combination of personalities in the groups is an important contribution to learning.

2. Methods of instruction applied to ESP class

a. Language learning strategies

Language learning strategies as defined by Oxford (1990: 8) are "specific actions taken by the learner to make learning easier, faster, more enjoyable, more self-directed, more effective, and more transferable to new situations". This view was taken as an input for our research. The questionnaires we applied to our engineering students at different study levels were conceived with the purpose to see the way they perceive their learning strategies, the way they apply them, whether/how deep they are aware of their passing on towards specific communication strategies in the foreign language.

The learner who approaches the task through active strategies that enable the construction of the rules of the foreign language is a successful learner. In the rule construction process, students make use of strategies that differ from one student to another, and are dependent upon the learning level possessed at the moment. Learning strategies (according to Stern, 1983; Oxford, 1989) represent the deliberately used techniques, behaviours and actions to facilitate learning. The conscientious attempt to use language knowledge, skills and information in a given context to produce communication enables more independent, autonomous, lifelong learning, when the students make use of the learning strategies in an effective and active manner (Allwright, 1990; Little, 1991). This is the passing stage towards strategic learning, i.e. the concept of a learner who sets goals, marshals resources, makes strategic decisions about resource use, and evaluates the entire process in an ongoing way.

b. Instructional methods applied to learner-centred language class

In designing our ESP classes we oriented ourselves towards applying those instructional methods derived from learner-centred theories of learning and motivation.

- Strategic learning and self-regulation. In our language classes the students were created opportunities to learn and exert self-regulation of their learning by involving them in setting learning goals, in selecting and implementing learning strategies, and in monitoring their own learning:

- Learning in groups. Our students were given more opportunities to make decisions about what and how to learn, if not individually, then at least as part of a collaborative group. In working with others to understand material, the learners have more open access to their own understanding and thinking processes. The collaborative learning increased individual control over learning; the students got immediate and more personal feedback and thus more motivation.
- Authentic problem solving. All authentic problem solving instructional methods depend on creating learning environments that are as close to the real environment of practice as possible. Based on authentic problem solving tasks, the potential for transfer of learning improved, the instruction provided both the situational cues for responding and the motivation for putting forth the effort.

3. Coordinates of the research experiment

To create adequate learning environments for students in the Technical University and apply the student-centred learning based instructional methods that best suit students' learning strategies with the ultimate goal of becoming effective communicators in English in different professional settings, non-linguistic variables affecting the acquisition, competence and performance of engineering undergraduates in ESP were studied together with students' perceptions of learning.

The time reference of the experimental work in the present paper goes back to 1996 as a result of a PhD research study (Grănescu, 1998) and 2012, when similar experiments were initiated and carried out with students in the same fields of specialization, subjected to similar requirements and taught in the same way with the common purpose to find out which learning strategies the students in our university use as well as the communication strategies they adopt.

The comparative tables for learning strategies (Tab. 1) and communication strategies (Tab. 2) show consistency and continuity in some respects as well as minor alterations or significant modifications of students' attitudes and dispositions for learning that have been occurring for over 15 years. Thus, the present study covers an area of research which extends within the horizontal coordinate of time (1996 and 2012), and the vertical coordinate, respectively, with frequently used cognitive, metacognitive and affective learning strategies, and communication strategies engineering students prefer to use or find at hand as more comfortable and, implicitly, effective ones.

We applied class task-accomplishment observation, administered questionnaires and interviews; we had discussions with our students using as a starting point the definitions given by O'Malley and Chamot (1990) to cognitive, metacognitive and affective strategies. In 1996, there were 250 undergraduates involved in the study. They were first and second year students in mechanical engineering and civil engineering. In 2012, 178 students in mechanical and civil engineering participated in the experiment. The results are given in percentages, and the accuracy of these results depends on the honesty of the respondents. It is evident that percentages show the extent to which students perceive that they make use of specific strategies.

RESULTS AND DISCUSSIONS

As Tab. 1 shows, engineering undergraduates use all strategies, cognitive, metacognitive and affective. Repetition, resourcing, translation, answers, grouping of data, deduction, recombination of data and visual representation were included among cognitive strategies. Metacognitive strategies mainly referred to attention, organization, self-management, and monitoring. We included self-correction, delayed production and self-

evaluation in self-monitoring strategies. After questionnaire administration, further discussions showed that percentages given by students had reasons behind. The averages obtained represented both subjective and objective self-evaluations.

We appreciate that differences are not wide in repetition, deduction of rules, visual representation and data grouping, but more students use today dictionaries probably because of Internet and mobile phone applications available. Still high is the percentage of silent answer and translating into their mother tongue what heard or seen.

Tab. 1

Learning strategies used by TUCN students in 1996 and 2012

Learning strategies	Percentage of students using the strategy in 1996	Percentage of students using the strategy in 2012
Cognitive		
• repetition	39%	37%
• use of dictionary/resourcing	33%	43%
• one word answer	17%	15 %
• silent answer	81%	76%
• translation of what heard	72%	70%
• grouping	41%	40%
• taking notes before speaking	65%	45%
• deduction of a rule	36%	37%
• recombination	60%	56%
• visual representation	42%	42%
Metacognitive		
• advance organization	11%	6%
• selective attention	61%	63%
• directed attention	77%	56%
• self-management	47%	57%
• functional planning	19%	30%
• self-monitoring, of which		
-self correction	40%	50%
-delayed production	19%	20%
-self-evaluation	19%	20%
Affective		
• cooperation	31%	51%
• question for clarification	43%	53%

As for the metacognitive strategies, fewer students organized learning in advance (1996) making a learning plan, considering that responsible for the organization of learning was the teacher. Today, a greater percentage of students make functional plans for learning, having objectives and projects for achieving the targets. They explained that they planned what they wanted to learn (their interest is selective, oriented to specific fields of ESP, only to grammar, or only to usage, items which they perceived as particularly useful) and in what time interval. The students who gave a positive answer motivated it by present opportunities to work in foreign contexts, in multinationals or in developing their own small companies. Similar to the past, learners expect data to be clarified, instructions to be detailed, and correct themselves either silently or loudly. The fear of making mistakes because self-evaluation tells

they do not possess the needed or expected level of knowledge has a significantly inhibitive value for communication.

Students' disposition for collaborative group work has significantly enhanced: 31% in 1996 vs. 51% in 2012. Students mentioned that learning to work in pairs and small groups opened their eyes on the potential value of the partners in learning, or that they could correct mistakes or errors with the help of their pairs. Many students thought they could not solve their tasks and homeworks without receiving clarifying details or having the information or instruction repeated. Almost half of the respondents admitted that they learned they needed clarification only when becoming university students.

In the attempt to find out what communication strategies our students used, we made appeal to Tarone's classification (1977), turned it into a questionnaire and administered it to undergraduate students in the same specializations, both in 1996 and in 2012. Tab. 2 presents the communication strategies students in our university used in 1996 and 2012.

Tab. 2

Communication strategies used by TUCN students in 1996 and 2012

Communication strategies	Percentage of use in 1996	Percentage of use in 2012
Avoiding topic because words or structures are not known	35%	24%
Abandoning message because of its difficulty	15%	6%
Approximation/reducing of message	27%	28%
Coining a new word (usually based on French/Romanian)	21%	20%
Paraphrase /circumlocution	16%	18%
Literal translation from mother tongue	9%	6%
Language switch	9%	15%
Asking for help	17%	20%
Mimic and gestures	13%	25%

A comparison of the figures found from students' responses in 1996 and 2012 shows that more students avoided speaking about a topic when they simply did not know the target language required in 1996 (35%) as compared to 2012 (24%). Also more students abandoned message emission or interrupted themselves in mid-utterance: 15% (in 1996) vs. 6% (in 2012). In the borrowing process, the learners translated word by word from their native language in a proportion of 9% in 1996 and 6% after 15 years. But it is interesting that less learners made language switches in 1996, compared to 2012 when 15% declared not bothering to use a term from mother tongue when not knowing the English term. This goes together with replacing language with mimic and gestures (more in 2012, i.e. 25%). An increase in the appeal for help (from 17% to 20%) is, however, found in our respondents. Approximation/reducing of message, coining a new word (usually based on French or Romanian), and paraphrase /circumlocution present similar figures.

The preferences for learning and communication strategies as found from our engineering students led us to the following conclusions that concern their learning styles:

- a) Some of the students have a concrete, practical learning style, i.e. they try to solve tasks with what available at the moment of learning, without resorting to clarifications, instructions, explanations;
- b) Other learners have an analytical style; they prefer not to make mistakes and hence, want to clarify first with the teacher and partners aspects regarding the tasks and then start working;

c) Students in engineering can have a communicative learning style and when it happens, they are very flexible, receive tasks without commenting, but in their solution they are not accurate because they feel that expressing their own opinions is more valuable;

d) Many students have a learning style, which depends on the teacher and partners, on additional ideas that could come from them; such students want a stiff learning environment not learning by discovery.

We could add the various anxieties that hinder or facilitate learning. By exposure to concrete examples of ESP language and indirect repetition of grammar items, students develop a personal, partial or complete, precise or vague, programme, some kind of “own syllabus”, which is the path they foresee as necessary for the success of their learning. When this syllabus comes in contradiction with that of the teacher a severe gap occurs between teaching and learning. Often the reason is the gap between the objective perception of the teacher (coming from questionnaires, interviews, diagnosis-tests for students’ needs, lacks and wants) and the strongly subjective wishes of the students. In such context, student-centred learning approach can be the answer to success in language instruction. It enables both the students and the teacher to adjust learning variables to common objectives, and struggle to achieve them, harmonize students’ individual differences, in order to acquire the ability to communicate effectively in professional English.

CONCLUSION

The differences among individuals that greatly influence the language instruction in university were discussed. They are variables that, basically, depend on previous experience in foreign language learning, high level of mastering mother tongue, elements regarding personality, attitudes, motivation, intelligence, learning styles as well as other preferences or prejudices, such as favouring learning coming from a certain teacher or partner. Such differences are interlinked and affect the progress rate, performance and learning quality in a positive or negative manner.

The experimental research work presented in the paper aimed at identifying the factors that influence learning ESP with undergraduate students in the first and second year of study in the Technical University of Cluj-Napoca as part of the student-centred learning approach implementing programme for ESP language instruction. The comparative study presents students’ preferences for using learning strategies in 1996, and 2012, respectively, at three levels: cognitive, metacognitive and affective. The change of the position in time with our students’ occurred at the metacognitive and affective levels, which significantly show a shift in their learning attitudes, skills and behaviours. The orientation in the learning process towards themselves (indicated by higher percentages recorded in 2012 for self-management and self-monitoring strategies) together with greater dispositions for cooperation and asking for clarification (affective level) indicates the engineering student’s profile in our university in terms of language learning strategies.

Learning strategies researched to improve students’ competence were supplemented with identifying the communication strategies our students know and use to ensure effective performance. The ability to communicate information in a proper way turns the student into a good communicator, as a result of being an effective learner. A good understanding and mastering of individual differences in learning and communicating in a foreign language can optimize student-centred learning in university.

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