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Task-Based Learning (TBL) and Cognition

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Abstract | Teaching in the 21st century is a huge challenge and every school has to cope with all the changes that occur within society and be, at the same time, an enjoyable place for the students to develop their skills to live and function in the 21st century society. This paper shows how Task-Based Learning (TBL) can be a valuable option in the foreign language classroom nowadays enabling the students to be active, interact with each other, learn by doing and develop their language knowledge through communicative tasks, replacing the traditional, teacher-centred lessons. At the same time, this article aims to show how doing tasks has advantages in terms of the cognitive development while learning a foreign language, how these tasks also affect the human brain as well as discuss the importance of bringing neuroscience and scientific evidence into the classroom context.

Key words | Task-Based Learning (TBL), tasks, foreign language learning, cognition, human brain and neuroscience

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> *The classroom should not be about direct instruction. . . . Human beings* ***should not be passive****. When they get together, they should be* ***interacting*** *with each other. They should be* ***solving problems****, or they should be* ***making things.***
>
> (Robinson 117)

> *Indeed, one of the most demotivating factors for learners is when they have to learn something that* ***they cannot see the point of because it has no seeming relevance whatsoever to their lives.***
>
> (Dörnyei 63)

The lack of student motivation is one of the biggest problems many teachers face nowadays. Of course, it can be due to many factors but one of the main reasons is that sometimes students cannot see any relevance in what they learn and do not have an active involvement in their learning process. These two quotations (Robinson 117 and Dörnyei 63) give a clear overview of what happens nowadays and are a starting point to reflect on possible solutions to these problems. Therefore, it seems obvious that the traditional teacher-centred lessons no longer interest students because they do not get involved in the classroom and become demotivated. Since motivating students is one of the main goals of a teacher it would be worthwhile to understand the way students learn and work best in order to adapt planning and strategies according to students' interests, making the learning activities and lessons meaningful to them. Task-Based Learning (TBL) seems a possible option for the foreign language classroom nowadays in order to prepare students for the 21st century, enabling them to learn the language and, at the same time, acquire the skills they need to live in society nowadays. Recently, there has been much talk on project-based lessons and task-based learning in teachers' meetings, conferences and workshops which shows a general consensus that the traditional teacher-centred lessons and direct instruction have to be replaced by student-centred approaches as a way of getting the students to become active, involved and engaged in the

lesson. When talking about learning a foreign language it seems even more obvious that if students learn a language, they should put that knowledge into practice, communicate outside the classroom, in the real world. Although TBL appeared in the 1970s with the Communicative Approach, a study was carried out to analyse how authenticity and real-world tasks can be brought to the foreign language classroom nowadays through TBL (Costa). Not only did this study prove that TBL can bring authenticity to the classroom and is appropriate for this day and age but also led to further research to find scientific evidence for the benefits of TBL in terms of the cognitive development and the learning process. In fact, bringing scientific findings related to brain studies to the classroom context is essential in understanding how humans learn (Masuhara). Furthermore, the affective dimension plays also an important role in student's learning (Immordino-Yang and Damasio).

Reference to Tasks in the Official Documents of the Portuguese Educational System

To understand the cognitive effects of doing tasks (TBL) is one of the main aims of this paper. Before presenting any evidence, it is important to mention that doing tasks is something stated in the official documents that regulate the Portuguese educational system (*Metas Curriculares* and *Programas*), which correspond to the different levels of the Common European Framework of Reference for Languages (CEFRL), mentioning the use of communicative tasks similar to those students find in their real world. According to the *Metas Curriculares* and *Programas* of the Portuguese Ministry of Education for English and German for example, the approach suggested is based on action and doing tasks that enable students to have a central and active role in their learning process, communicating and conveying meaning. Value is also attributed to activities and tasks similar to those in the real world that allow student involvement, having the opportunity of developing himself/herself as a whole: cognitively, affectively and socially (*Ministério da Educação*, Lapa, Mota and Vilela). The teacher can choose the best strategies to put those suggestions into practice. These views are related to the ideals of Communicative Language Teaching.

Task-Based Learning (TBL)

TBL became popular after Prabhu (1987), who was working with secondary school students in India, noticed that they learned a language better if they were concentrated on doing a task or solving a problem instead of paying attention only to formal, linguistic aspects (Harmer).

Here are two definitions of TBL:

> The central focus of TBL is doing tasks. The aim of the task is to create a real purpose for language use and provide a natural context for language study. Students prepare for the task, report back after the task and then study the language that arises naturally out of the task cycle and its accompanying materials. (Willis 1)

> Task-based learning is a different way to learn languages. It can help the student by placing him/her in a **situation similar to the real world**, a situation where **oral communication** is essential for completing a specific task. Task-based learning has the advantage of getting the student to use **his/her skills at his/her current level** to help **develop language through its use.** It has the advantage of making the student focus on achieving a goal so that **language becomes a tool**, making the use of language a **necessity**. (Methods 3)

It is important to reinforce that a task in TBL is not a simple exercise aiming to reproduce or practice a specific formal structure as happens in the PPP framework (Presentation, Practice and Production) which is still very common nowadays and is defined by the presentation of formal structures, their controlled practice and their production towards the end of the lesson. According to Willis (1996), Skehan (1998), Ellis (2003), Nunan (2004) and Willis & Willis (2007), a task in TBL implies the pragmatic use of the language to convey meaning and achieve a final outcome by communicating. When talking about TBL is important to compare it with PPP.

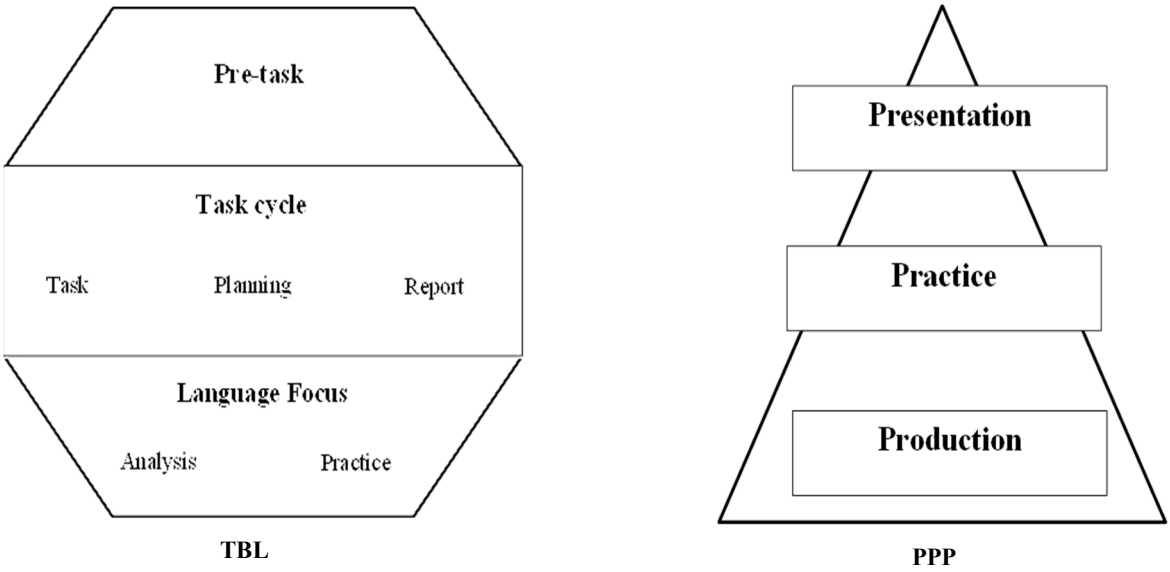

Figure 1 - Structure of TBL and PPP

PPP is related to the Audiolingualism (from the USA) and Situational Language Teaching (from the UK) in the 20th century that defend the correct use of the grammatical structures as a way of learning a language. There is a contextualised presentation of the structures, repetitions, practice and production, limiting what students can learn to that which is controlled by the teacher (Harmer). These characteristics are different from TBL since here students play a central role and the teacher doesn't control what the students learn. Although some studies on PPP proved that it isn't very efficient in terms of students' proficiency when they have to put the language knowledge into practice in different contexts, it is still used very often nowadays for two main reasons: the control that the teacher has during the lesson and in terms of assessment of learned structures which implies only a right or wrong answer (Skehan).

TBL has three stages: **pre-task**, **task cycle** and **language focus**. In the pre-task, the theme is introduced through expressions, structures and vocabulary, activating previous knowledge and the teacher explains the task and can present examples of similar tasks performed by other people. In the task cycle, the students do the task in pairs or in small groups. The teacher monitors students' performance from a distance, enabling them to use their

own knowledge avoiding asking questions to the teacher all the time. After doing the task, the students prepare and plan how they are going to present what they did, what they found out and their main conclusions. This moment is important because the students prepare carefully what they are going to present, paying attention to the language they use: formal structures, vocabulary and content. This moment enables language development (Willis). In the report stage, the teacher should praise all the positive aspects and encourage students to continue working because students' performance is not likely to be native speaker-like. In the last stage, language focus, they discuss and analyse the linguistic aspects that came up during the task. There is a focus on the form; students practise the linguistic structures that appeared within the context and in a natural way (Willis).

As mentioned above, TBL implies students' involvement and learning by doing. Therefore, it is important to focus now on what happens when doing a task in terms of the learning process (cognitive effects).

Doing Tasks and Cognition

Nowadays there is a need to link the theories of language acquisition with other areas, such as neuroscience, that offer useful and complementary information to teachers and educators of how the learning process occurs. If the association of different fields is necessary, it is also true that there is still much to be done (Masuhara).

It is in the brain that the learning process takes place through the synaptic connections between neurons. Each neuron has a cell body, dendrites, axon, myelin sheath and axon terminal. It functions as a vehicle for the circulation and information processing and it is responsible for the conversion of electrical and chemicals signals in both ways (Jensen).

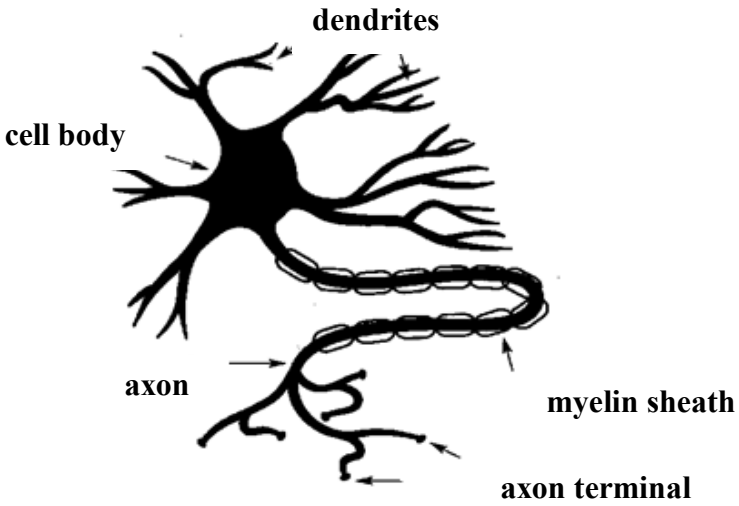

Figure 2 - Neuron (Jensen).

The axon connects to the dendrites of other neurons and conducts information as electrical stimulation and transports chemicals substances (Jensen). When a neuron is stimulated, it fires an electrical impulse to other neurons. At the same time, when there is a positive environment, the dendrites grow and branch out. The information circulates in each neuron as electrical impulses and only goes to other neuron as chemicals impulses, known as neurotransmitters, through the synaptic cleft, which is the meeting point between two neurons. The electrical message is sent from the cell body to the axon releasing chemical signals (Jensen). When there is the repetition of the same episode or information, the connections between neurons become more efficient, leading to its memorisation; when the information is new and stimulates the brain, it leads to new neuronal connections and creates enriched neurons. The difference between an enriched and an impoverished neuron is clear: there are more branches of the dendrites and more connections in an enriched neuron.

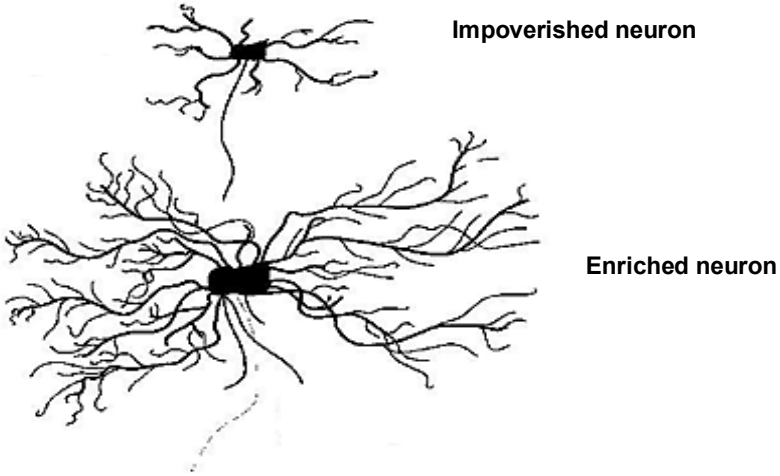

Figure 3 - Difference between an impoverished and an enriched neuron (Jensen).

Doing tasks and solving problems leads to brain development because there is a release of noradrenaline, a neurotransmitter synthesised from dopamine which is involved in stimulation, rewarding and humour mood (Wolfe) and enables dendritic growth.

According to the Information Processing Model (from the 1950s) the information that arrives through the sensory receptors and arouses the interest of the sensory memory is sent to the working memory so that it is worked and can be stored in the long-term memory. Situations that imply the releasing of adrenaline and noradrenaline by the adrenal cortex are related to a better memorisation; here emotional factors have a significant influence. Therefore, in the classroom context, emotions should play an important role and the type of activities a teacher chooses is also very important: experiences and activities that are related to learning by doing, experimenting and trial and error because they are meaningful and increase the emotional connections: “Neither learning nor recall happen in a purely rational domain, divorced from emotion, even though some of our knowledge will eventually distil into a moderately rational, unemotional form” (Immordino-Yang and Damasio 127).

In a positive environment the brain releases neurotransmitters related to pleasure: endorphin and dopamine. The same happens in the classroom context when students are doing tasks that raise their interest, which can also be in pairs or in groups (TBL).

TBL and Learning a Foreign Language in the 21st Century Society

The characteristics of TBL seem appropriate for the 21st century learners because they are "better described as doers and explorers than as reflective or thoughtful people — doers and explorers who also demonstrate the characteristic impulsiveness of youth. The DIY (Do It Yourself) and DIWO (Do It With Others) principles guide many of their actions" (Prestes 2).

> This generation seeks out a sense of the practical in what it does, and prefers that what it learns can be explored and applied. Because of this, its learning is closer to the model of "just in time" than that of "just in case" that is typical of traditional education. This generation prefers to learn what is applicable in the present, and not what may be usable in the future. (Prestes 2)

In general, students need to do, experiment, develop something by themselves. Therefore, TBL enables an active role and involvement by the learners. Students are described nowadays as digital natives and multitaskers. At the same time, they are also functional, smart, social, superfast, optimistic and with the capacity to collaborate and get involved (Boschman and Groen).

Our 21st century society, also known as the knowledge society, is defined by constant change, in a globalised world influenced by technology which affects the way people live, work and communicate. If society has changed, school needs to change too in order to prepare students for the real world. It is crucial to have student-centred classrooms instead of the traditional model in which the student has a passive role. Students need to be critical thinkers and be prepared to solve problems, collaborate and communicate. In fact, creativity, critical thinking, collaboration and communication are the 21st century skills that teachers should implement in their lessons.

Two action research studies by Ruso and Pinto are examples of the efficiency and advantages of TBL in the foreign language classroom. The first Action Research was implemented in two English classes of the Eastern Mediterranean University (Cyprus) aiming to find solutions to the lack of students' motivation that were used to a more traditional approach.

The main conclusions were: TBL increased students' motivation and was efficient in terms of vocabulary acquisition and memorisation due to the materials chosen and the activities done. The students enjoyed the active role they had in the classroom and were involved doing the tasks. There was an increase of interaction and communication among students and an enjoyable classroom environment. The second Action Research (Pinto) was implemented in Cape Verde for a month in three schools. The students did the tasks communicating and their motivation and interaction also increased. At the same time, the focus on form happened in a natural context with real communicative situations to express meaning.

Learning in the 21st century means enabling the students to be critical thinkers, not only learning things by heart but questioning and interpreting facts and information, to have their own opinions and points of view, which is something related to the type of tasks they do in a TBL lesson. To help teachers check if their students are able to think critically there is a useful, well--documented, reference: A Taxonomy of Educational Objectives, also known as Bloom's Taxonomy, which was created by a group of investigators of different universities of the United States of America led by Benjamin Bloom in 1956. In this taxonomy, usually represented in a pyramid, there are different levels, from the simplest to the most complex ones. Students' answers and performance help teachers to check if they are critical thinkers, according to each cognitive process that is mentioned for each level of the taxonomy. If students can do what is described at the top of the pyramid it means he or she is able to think critically (from Lower-Order Thinking Skills (LOTS) to Higher Order Thinking Skills (HOTS)).

TBL enables the students to communicate, express meaning, learn by doing and experiment through trial and error to accomplish a final outcome as it happens in the real world when people communicate with each other. These ideas are related to the characteristics of the Communicative Approach: learning a language means learning to communicate and express meaning; the language is produced through trial and error; there is comprehensible pronunciation but not necessarily like a native speaker; the use of native language and translation can be used if there is a benefit for the student (Finocchiaro and Brumfit in Richard and Rodgers). Learning

by doing, which is at the heart of TBL, is also related to Constructivism (Piaget) and to Social Constructivism (and its principle advocate, Lev Vygotsky) social interaction is vitally important for cognitive development. Cooperative learning and the Zone of Proximal Development (the difference between what the student can do alone and what he can do with the help of a more experienced person: a classmate or a teacher), are two concepts of Social Constructivism and the teacher functions as a facilitator not giving the answers but helping the students to find them, "scaffolding" (Bruner, 1967).

Despite all the constraints and pressures of teaching (the national programme to follow as well as the adopted coursebook) the teacher has the autonomy to choose the strategies, activities and materials appropriate to his/her class in order to promote students' motivation and learning. A teacher should, whenever possible, choose activities and lessons that are meaningful to the students, according to their interests and motivation, this is likewise true in a TBL lesson. They should make what learners learn 'value added' so that they have the knowledge and skills to live in the 21st century society (Ellison).

> We are living in an age where the content taught in schools and the skills needed in a rapidly evolving world is a constant balancing act. If educators are to fulfil their role in society, they must reflect on what and how they teach so that they help to equip children with the knowledge, skills and understanding they need to be able to live and function in society. This does not mean that we have to reinvent the wheel, it simply means that we have to make what we teach "value added". That is, make it more relevant, get more out of it. (Ellison 23)

Making the activities meaningful to the learners also means establishing aims that include the 4Cs related to CLIL (a concept derived from Content and Language Integrated Learning – CLIL – but now made use of more 'generalist' contexts): **C**ontent (contents and the way they are taught), **C**ommunication (the language of, for and through learning), **C**ulture (the knowledge the student has of himself/herself and others and what he/she can learn alone or with other classmates) and **C**ognition (aims that promote critical thinking) (Coyle, Hood and Marsh). By

doing this, learning becomes more meaningful because it integrates different areas of knowledge. The language appears naturally and there is a communicative goal to achieve a final outcome.

> As educators have long known, it is simply not enough for students to master knowledge and logical reasoning skills in the traditional academic sense. They must be able to choose among and recruit these skills and knowledge usefully outside of the structured context of a school or laboratory. (Immordino-Yang and Damasio 128)

TBL in the Foreign Language Classroom - Examples of Tasks:

When talking about TBL it is also important to know examples of activities that can be put into practice in the foreign language classroom. Willis & Willis give a clear description of different examples. It is a taxonomy based on cognitive processes, from simple to more complex tasks. The less complex tasks introduce the more complex ones.

Examples of tasks (Willis and Willis):

- **Listing:** presenting vocabulary, topics, ideas and information about a specific theme through brainstorming and fact-finding;
- **Ordering and sorting:** it implies sequencing - ordering a sequence of pictures or paragraphs in the correct order; ordering and ranking the vocabulary on a list according to different criteria; classifying: from a list of vocabulary the students put each one in the right category using tables, grids and present the advantages and disadvantages through mind maps;
- **Matching:** matching the words to the definitions or pictures to the descriptions;
- **Comparing and contrasting ideas:** compare and contrast ideas while interacting with other students and present them;
- **Problem solving:** these are more complex tasks that enable the students to solve a problem or a situation. It is better when more simple tasks related to the theme have

been done before. Therefore, it is recommended that the theme and the type of activities are appropriate to students' age and level.

- **Sharing personal experiences:** the same happens in the real world when people share stories and personal experiences. It promotes communication and fluency and develops social skills;
- **Projects and creative tasks**: these tasks enable the students to use tools, gadgets and knowledge from other areas to be creative. Examples of these tasks are: posters, portfolios, pamphlets, videos, websites, radio programmes, magazines and newspapers. As digital natives, students learn the language using technology: upload pictures, make videos and other tasks.

What makes these tasks examples of TBL is the fact that they are the centre of the lesson and students have a final outcome to accomplish and present to the other students.

Conclusion

According to the characteristics of 21st century society and learners, TBL may be a valid option for the foreign language classroom in an effort to replace the traditional teacher-centred lessons that still dominate Portuguese classrooms. TBL can help to foster advantages in terms of the cognitive development, and at the same time, it provides students with opportunities to be active and engaged in the lesson, learning by doing, using ICT tools and gadgets. Through TBL students may acquire the skills that have been identified as fundamental for 21st century society: collaboration, creativity, communication and critical thinking. It may also be a way to overcome and deal with students' bad behaviour, lack of attention and low motivation. Learner-centred lessons can be one of the possible ways to involve and engage students and prepare them for the real-world. At the same time, it is also true that neuroscience and other areas are crucial for

understanding language learning process and provide teachers with scientific and biological evidence to improve their work.

Note

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