

# TECHNOLOGY, ENGLISH LANGUAGE TEACHING AND INTERNATIONALIZATION AT A CROSSROAD: INSIGHTS FROM THE ANALYSIS OF A VIRTUAL LEARNING ENVIRONMENT IN BRAZIL

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## Abstract

The paper reflects on the impact of technology and internationalization in education in general and in English as a foreign language (EFL) teaching in Brazil in particular. So as to foreground the discussion the study reviews educational policies in regards to the role of technologies and English as a foreign language teaching and learning in Brazil and analyses the affordances of an English as a foreign language distant learning course offered in a virtual learning environment by the Brazilian Ministry of Education as part of its internationalization agenda. The course analysed - My English Online (MEO) - is part of the English without Borders (EwB) internationalization program launched in 2012 by the Brazilian government to correct a perceived historical deficiency in EFL learning in that country and so as to boost the internationalization process there. The EwB Program includes many actions to foster EFL learning but the three most important ones are 1) the MEO course, 2) the Nucli face-to-face classes offered in federal universities and 3) the administration of Toefl tests for university students. The present study addresses internationalization and educational policies in Brazil in relation to the use of technologies in general and the effectiveness of the MEO course for EFL learning in particular, discussing the ergonomic features of the software underpinning the virtual learning environment as well as its affordances and limitations in what concerns EFL development. Data analyses suggest that the MEO course might not be sufficient to promote language learning by itself since interaction and oral practice are important aspects of foreign language learning apparently not catered by this virtual learning environment. In line with these results, the analysis of students' perception of the use of MEO suggests that the speaking ability is seen as the most challenging one to develop through the use of the online course. In addition, students believe that the lack of correction of written texts and audio recordings impact negatively on EFL learning. Regarding the usability features of the software, results point to the conclusion that the lack of a feedback is a negative feature of the course analysed, as well as its lack of affordance for the development of productive skills such as speaking, revealing a fragile relationship between the pedagogic and ergonomic characteristics of the software. Overall, findings support the claim that Brazilian foreign language and internationalization policies should undergo a major restructuring to include the development of productive skills in the target language in primary and secondary schools and the recognition of the role of English as an international language if the aim is to combat the perceived lack of English language proficiency affects and is affected by the internationalization and social development in that country.

Keywords: EFL teaching and learning, Technology, Internationalization, My English Online.

## 1 INTRODUCTION

Globalization contributed to the emergence of the information society [1] and knowledge economy [2], which in turn, contributed to the internationalization of higher education [3]. Internationalization can be defined as the process of integrating international, intercultural or global dimension in the mission, function or proposal of a higher education institution, thus reflecting the effects of globalization [4]. In this scenario, universities are viewed as valuable assets for their intellectual capital, which is now seen as an import and export product in the knowledge economy [3].

Another effect of globalization is related to the technological advances, especially with regard to new information and communication technologies (hereafter NICTs), which enabled a more democratic and inexpensive flow of information, products and services. This flow of information and the affordances of

NICTs have changed the way we express ourselves in the new global and local scenarios. NICTs have also changed the way we acquire information and produce knowledge, as shown, for example, by the number of massive online open courses (MOOCs)<sup>1</sup> offered with and without certification by world-class universities.

In Brazil, the population has witnessed these global and local tensions more vividly than ever before through the impact of social networks, specifically Facebook, used to trigger and spread public protests that started in June 2013 with the Free Pass Movement<sup>2</sup> and are going on now with the upcoming election for President of October 2014. Other important social movements in Brazil, such as the "rolezinhos"<sup>3</sup>, were also organized by this social network, to mention just two examples of social movements triggered by the new way of relating to and in the world through the internet and NICTs.

The representation of languages in the internet show an interesting number for Brazil, labeled as the "social media capital of the universe" by the Wall Street Journal and as "the future of social networks" by the Forbes magazine in 2013<sup>4</sup>. Brazil stands out on the world stage as a phenomenon of social networks by its exponential number of users. In September 2013, Brazil reached the milestone of over 80 million web users and it is estimated that over 78% of those access some kind of social network. Facebook has over 76 million Brazilian users making Brazil the second country in the world in relation to daily access to this social network.

[5] argue that in the current information society, both English as an international language and digital literacy are passports to information access and social inclusion as well as for social capital formation defined as the ability of individuals to generate benefits by means or their personal relationships or social practices [6]. [5] claim that interaction in English and in the net can foster the development of a global citizenship. Perceiving a historical deficiency in the level of proficiency in English of Brazilian students and aiming at taking Brazilian higher education to an international level, the Brazilian Ministry of Education launched the internationalization program English without Borders (EwB) whose aim was to correct this historical deficiency through three main actions provided for free for public university students: a virtual learning environment – My English Online (MEO), face to face classes and Toefl tests. Having outlined this panorama, this paper aims to reflect on the impact of globalization, technology and English language teaching in Brazil by analysing the affordances of the online course My English Online (MEO) offered in a virtual learning environment (VLE) by the EwB program.

## 2 REVIEW OF LITERATURE

### 2.1 Internationalization and technology in language teaching and learning

[7] analyzed the internationalization process of two Brazilian universities with different backgrounds and motivations to go international: a public university (whose motivation for internationalization was assumed to be academically-driven since public universities are non-profit organizations in Brazil) and a private university (whose motivation was assumed to be also financially-driven since they can charge fees). The analysis of the two institutions showed that the motivation to go international, contrary to what was expected, is inexistent in the private institution since the internal market is very large requiring no efforts to attract foreign students. The motivation to go international in the public institution analyzed, on the other hand, does exist and seems to be academically-driven but faced with a number of challenges, among which the most pressing one is the linguistic barrier. [7] concluded that the greatest obstacle for the internationalization of higher education in both universities investigated is the low level of proficiency in English of university students. We believe that the scenario described by [7] is representative of most universities in Brazil, be them public or private.

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<sup>1</sup> Massive Open Online Courses (MOOCs) are open courses that use web 2.0 tools to provide an opportunity to expand knowledge to millions of internet users. Some of the most popular MOOCs worldwide are Coursera, Udacity and EDX and in Brazil Open (UNESP) and Veduca (USP).

<sup>2</sup> The Free Pass Movement is a Brazilian social movement that advocates the adoption of zero tariffs for public transportation. The movement was founded in a plenary session at the World Social Forum in 2005, in Porto Alegre, and gained prominence by participating in the organization of protests in São Paulo in 2013.

<sup>3</sup> The "rolezinhos" can be defined as social events organized by young people through social networks to meet at shopping malls in Brazil.

<sup>4</sup>(<http://www.estadao.com.br/noticias/impresso,em-2013-brasil-vira-potencia-das-redes-sociais,1111960,0.htm>), (<http://www.estadao.com.br/noticias/impresso,em-2013-brasil-vira-potencia-das-redes-sociais,1111960,0.htm>), (<http://g1.globo.com/tecnologia/noticia/2013/09/brasil-e-o-2-pais-com-mais-usuarios-que-entram-diariamente-no-facebook.html>)

[8] analyzed Brazilian internationalization policies enacted in the Science without Borders (SwB) and English without Borders (EwB) Programs. The Science Without Borders Program can be described as a program of academic mobility OUT and the reason for the low uptake of grants offered by this program was mainly due to lack of English proficiency of Brazilian candidates. In order to fill in this gap identified the government launched the English without Borders Program in 2012 to correct a historical deficiency in English as a foreign language learning in Brazil. [8] concluded that a greater investment in English language teaching and learning, both in basic and in higher education is needed to boost internationalization in Brazil.

In their way to internationalization, Brazilian universities also face challenges other than the lack of clear national policies or investments, which, most of the time, refer to the barriers built to resist the effects of globalization, as for example, in the case of the resistance to include NICTs in education as shown by [9]. The aforementioned study analyzed a teacher training course for the use of NICTs in traditional classes at university, departing from [6] concept of social capital that differentiates between two types of access to NICTs - the limited access which includes access to equipment and does not necessarily lead to the formation of social capital and the broad access, which implies the critical use of equipment available for education and individuals. [9] concluded that the greatest obstacle for the use of NICTs in higher education classes in Brazil is not related to the limited access, as proposed by [6], since universities and schools are in general, well equipped, but rather to the broad access to NICTs, that is, to the critical use of equipment and technologies to generate benefits for users and their communities.

[10] investigated the beliefs of four teachers and nine university students regarding the use of NICTs in two contexts: (1) on a continuing education course for the use of ICTs in the classroom (2) and in an English for Specific Purposes (ESP) course, both offered through the Moodle platform, during one semester. Results of their study show that the use of NICTs by university teachers is still scarce. Teachers perceive the incorporation of such tools as an extra burden for the pedagogical praxis. The researchers concluded that although the course offered practical and theoretical knowledge on the use of NICTs in hybrid learning environments, this was not enough to change teachers' beliefs regarding the use of technology for educational purposes. As for the students, results of the study indicate that they see the use of NICTs as more opportunities for learning, interaction and foster language learning, thus validating the use of these tools in education.

Given the need to rethink the English teaching methodologies in the face of globalization, [11] attempted to understand, from a cognitive perspective, the contribution of a software especially designed to teach English as a foreign language for beginners. The study aimed at reporting (i) the cognitive/mental operations required by the software to perform the tasks proposed; (ii) the pedagogical strategies implemented by the software; and (iii) its degree of interactivity and usability based on the analysis of Human-Computer Interaction (HCI) aspects of the software. Overall results of the study suggest that the software presents a content-oriented approach to language learning. The ergonomic analysis revealed that the pedagogic resources applied by the software meet most usability criteria, requiring few modifications, particularly in terms of feedback to users.

[12] also investigated the contribution of the use of technological resources to teach English as a foreign language (FL). More specifically, the study focused on the learning of a syntactic structure by means of grammatical instruction provided in two environments: a traditional classroom and a virtual learning environment - the MOODLE platform. A secondary aim of the study was to assess participants' level of satisfaction concerning the activities implemented in the MOODLE. Thirty students enrolled in the second year of the Technical High School Program at a Federal Institute, divided into control and experimental groups, participated in the study. Statistical analysis revealed that participants performed well in the tests for the retention of the syntactic structure. The control group outperformed the experimental one in both retention tests. Results were discussed in light of information processing and second language acquisition theories. Regarding the qualitative analysis, data revealed that, although participants have access to several technological resources, they seem unable to perceive these resources as relevant to foreign language learning. The study also showed that, in general, participants enjoyed the activities carried out in the MOODLE once more corroborating findings that suggest that students' are more likely to use NICTs for pedagogical reasons than teachers.

In yet another study, [13] analysed the perceptions of high school freshmen on the use of technology during their English classes in a hybrid approach that combined traditional classes with the use of an educational software. The analysis showed that most participants understand there are advantages in the use of the educational software used in regards to learning English in the hybrid context, but do

not believe in an approach that uses only technology for that purpose. Moreover, the results also suggest that the software used in the study may represent an important technological tool in the teaching and learning of English as it introduces learners to a more modern educational perspective which is aligned with current demands of the technological world.

So far, evidence provided in this article points to the conclusion that NICTs are not used in Brazilian contemporary education as wished and should be critically incorporated in educational practices of and for the 21<sup>st</sup> century since technology seems to be more than a mere supporting tool for English language teaching and learning as seen by the use of social networks in Brazil, for example. Another effect of globalization is related to the role of English which in the case of Brazil, seems to be regarded as more than just another foreign language as shown by the internationalization policies and investments in English language teaching and learning enacted in the English without Borders Program. Given the panorama outlined here, the present study aims at reflecting on the effects of globalization on the Brazilian education in general and on internationalization in particular by analysing the online course (My English Online) provided by the English without Borders Program.

## 2.2 The MEO

The English without Borders is a Brazilian<sup>5</sup> internationalization program created to enhance the English language proficiency of Brazilian university students. The program was created to correct a perceived historical deficiency of investments for the development of that language in Brazil. The program offers three main actions for free for public university students: an English distance learning course named My English Online (MEO)<sup>6</sup>, English language classes offered to some federal university students in the face to face mode and the administration of English proficiency tests (Toefl ITP). Though the Toefl and MEO are available for all public university students the face to face classes cover only a small percentage of students. By way of example, in the university where data were collected there are about 25.000 students and only 480 vacancies are offered in the face to face courses whereas all 25.000 students can use the MEO course to learn English and take the Toefl test. The program is a joint action among the Brazilian Ministry of Education (MEC), the Department of Higher Education (SESu) and the Coordination of Improvement of Higher Education Personnel (CAPES). Its main objective is to encourage the learning of English and provide a comprehensive change and structuring of English language proficiency in Brazilian universities to boost internationalization.

MEO offers users a full suite of interactive activities for English language study, anytime, anywhere. The user has access to a placement test, interactive books, graded readings (National Geographic), grammar exercises (with immediate correction), dictionaries, oral activities to practice and follow-up testing. In addition, materials can be printed for offline reading. The course is divided into five levels of learning. Each level contains three parts covering activities with e-Book, video, grammar and reading. At the end of each part, the user must take a Test Progress in preparation for the Final Test level.

## 3 METHOD

The main aim of the present study was to investigate the affordances and limitations of the software underpinning the virtual learning environment My English Online (MEO). In order to accomplish that goal, the perceptions of 25 Brazilian undergraduate students of a federal university about MEO were analyzed. The median age of the group was 23, *SD* = 4.07. All participants were, at the time of data collection, besides taking the online course, attending face to face English classes at the university as part of the English without Borders Program.

Students' perceptions about the online English course were collected through the administration of two questionnaires, one designed to assess students' satisfaction with the course and another to evaluate the ergonomic features of the software. The first questionnaire was composed of open questions (see Appendix 1) that aimed at capturing students' impressions of MEO and its prospective contributions to English learning. The second questionnaire comprised a list of eighteen ergonomic criteria (see Appendix 2) submitted to students' evaluation on a Likert-type scale of six level (0 to 5). In this scale, level 0 meant the criterion was not met at all by the software, while level 5 indicated the software fully met the criterion analyzed. The questionnaires were sent to students by electronic mail and were

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<sup>5</sup> <http://isf.mec.gov.br/>

<sup>6</sup> <http://www.myenglishonline.com.br/>

administered in their L1 – Brazilian Portuguese. Data from the first questionnaire were summarized into four main categories so as to have a panel of students' most frequently mentioned opinions regarding MEO. Data from the second questionnaire were submitted to a descriptive statistical analysis in order to observe the frequency of students' ratings for all ergonomic criteria evaluated. The ergonomic analysis, in turn, focused on criteria of usability of the software following [11], with some modifications. For this study, besides a detailed description for each criterion, raters (in this case, students) were provided with examples of how the software should present the information in order to meet the criterion being analyzed. The following section presents the data analysis and discussion of the main findings.

#### 4 RESULTS AND DISCUSSION

Students answers to the open questions of the first questionnaire regarding their level of satisfaction about the software underpinning the virtual learning environment (VLE) MEO are summarized in Table 1.

Table 1 – Students' opinions on the affordances and limitations of MEO (n=25)

General opinion about the virtual learning environment	The methodology is helping to improve English	An online course only is not enough to learn a foreign language	Most difficult activity do develop through the virtual learning environment
good/ very good (23)	yes (22)	No (19)	Speaking (11)
bad / does not met expectations (2)	a little (3)	Yes (6)	other activities/did not answer (14)

Regarding the evaluation of the online course, the VLE and the methodology were well rated by students though most of them (19) claimed that a distance learning course is not enough to guarantee foreign language development since spoken interaction (not afforded by the course offered in the VLE) is needed to drive fluency in the foreign language (FL) forward. Another reason that might explain why students believe in the necessity of face to face classes in combination with an online course in order to learn the FL might be related to the fact that, the great majority mentioned that the lack of feedback about the texts produced and the audios recorded and posted in the VLE impact negatively on the learning process since users are not aware of whether they got the task right or, in case they did not get it right, what is needed to accomplish the task successfully. The fact that MEO fails to promote adequate instructional feedback concerning written and listening activities may indicate some kind of ergonomic deficiency (as will be argued elsewhere in this section) as it may reveal inadequacies in the way hits and misses are reported by the software.

Another interesting result is related to the development of the speaking skill. As revealed by data analysis, most students reported finding it the most difficult ability to learn through MEO, which can be easily explained due to the fact the development of this skill is not afforded by the software as previously mentioned. However difficult speaking development might be, it is worth mentioning that it has been considered the main goal of most foreign language students whose desire is to be able to communicate fluently in the language they are studying [14]. Therefore, given the goal of the MEO course and the need to prepare undergraduate students to take part in the academic routine of English-speaking universities worldwide, the online course analyzed should offer the possibility to improve this skill. If learners do not have the chance to learn how to communicate in the target language efficiently through a course designed with that aim, then it is plausible to argue that they might face difficulties during their experience abroad. Besides, for some second language acquisition researchers [15], production is necessary to drive language acquisition forward and given the lack of feedback on oral and or written production observed in the MEO, we can say that production skills are not bound to be developed in a satisfactory way through this course.

What this scenario shows us is that government internationalization policies enacted in the English without Borders Program regarding the development of English proficiency in Brazil, though well intended, can be improved in at least two ways: (i) start the investment earlier by offering the same actions offered by the EwB program for university students (MEO, face to face classes and Toefl

Tests) for basic education so that when students reach college level they already have a good level of English proficiency; and (ii) provide tools for the development of productive skills (specially speaking) not afforded by the MEO.

### Descriptive Statistical Analysis

Eighteen usability criteria of MEO were assessed by the students who participated in this study. Descriptive statistics were used to summarize participants' perceptions of the software. Results can be seen in Table 2.

Table 2 – Usability criteria assessment of MEO (n= 25)

Criterion	Frequency of students' rating for each level of the Likert scale (0 to 5)						Criterion mean
	0	1	2	3	4	5	
1. Promptness			4	7	10	4	3,56
2. Grouping by location		1	5	3	8	7	3,63
3. Grouping by format		1	1	9	7	6	3,67
4. Feedback			3	5	9	8	3,88
5. Readability			4	2	8	11	4,04
6. Concision		1	3	4	4	13	4,00
7. Minimal actions		1		4	11	9	4,08
8. Informational density			2	2	9	12	4,24
9. Explicit actions			2	4	6	12	4,17
10. User control	1	1	4	3	7	8	3,58
11. Flexibility	7	2	3	5	3	4	2,29
12. User experience	3	6	2	3	7	4	2,68
13. Error protection	4	1	1	6	8	5	3,12
14. Error message	1	1	3	7	6	6	3,42
15. Error correction		2	2	7	6	8	3,64
16. Consistency	1	2	2	2	5	13	3,88
17. Meaning		1	1	3	9	11	4,12
18. Compatibility	1		2	2	11	9	3,96

As can be observed in Table 2, the criterion of Informational Density, which refers to the fact that the software shows only necessary information across its screens, without opening many windows to distract or overload the user's memory, was the best rated criterion by students (mean 4,24). The worst rated criteria, on the other hand, were the criterion of Flexibility (mean 2,29) and the criterion of User Experience (mean 2,68).

The criteria of Flexibility refers to the fact that the software allows the user to adapt the system interface to their particular needs as, for example, in the personalization of screens, colors, fonts and document configuration. It is interesting to note then that the criterion of User Experience is somehow related to the Flexibility criterion once it also refers to aspects of the software that can be handled by users (students), which may have led students to assign similar ratings to both. Recall that this criterion has to do with how well the software allows for the execution of a task in different ways taking into consideration the level of user experience. It also relates to the varied ways the software can present the same information to different types of users: beginners and advanced. Flexible software also allows more experienced users to replace the use of the mouse by commands and/or keyboard shortcuts.

The findings regarding the criteria of Informational Density, Flexibility and User Experience are in line with evidence reported in [12]. In that study, high school students were asked to rate an educational software widely used in Brazil to teach English, particularly in private and language schools. Students found the software met the Informational Density criterion well, but did not do so for Flexibility and User Experience ones. Both were seen as deficient and in need of adjustments. According to [12], thirty-three computing learners claimed the software analyzed did not allow users to alter background color, font size or any other type of configuration. Thirty-five of them also reported it was impossible to choose to use keyboard shortcuts instead of the mouse to execute specific commands.

Differently from the results observed in the present study, in [12], twenty-four computing students rated the criterion of Feedback negatively. In their opinion, the software analyzed failed to provide adequate feedback for the tasks performed. That is, the feedback offered by the software was taken as superficial and did not include a summary of wrong answers or whether how to correctly solve them. Although this rating pattern was not observed in our data, as shown in Table 2, it somehow appeared in participants' reports to the first questionnaire when they mentioned their difficulty to notice advances in writing and listening skills due to not knowing whether the texts and audio recordings produced were correct. As explained by [12], a detailed feedback that offers not only technical information about the software but also pedagogic hints is necessary to lead students to the development of the cognitive operations underlying the very process of learning, such as observation, analysis, synthesis, solution planning, comparison, and, specially, generalization. The ability to generalize is an important one to the restructuring of already learned material. As put forward by cognitive theories of learning [16], restructuring refers to a shift in learners' internal representations (in this case, language representations) needed to accommodate newly acquired forms to those already stored in the learner's foreign language system, which, in turn, approximates learners, step by step, to the mastering of that language. Through generalization, learners test their hypotheses about the foreign language each time they perform in that language. When feedback is provided, they use it to confirm or refute their hypotheses, thus restructuring the knowledge previously acquired.

## 5 FINAL REMARKS

In general, the findings of the present study suggest that MEO might not be sufficient to promote language learning by itself since interaction and oral practice are important aspects of foreign language learning not catered by this online course. Aligned with these results, the analysis of students' perception of the use of MEO suggests that the speaking ability is seen as the most challenging one to develop through the use of the MEO. In addition, students believe that the lack of correction of written texts and audio recordings impact negatively on EFL learning, once they are not aware of what must be improved and how to accomplish it.

Another drawback concerning MEO refers to its lack of affordance for the development of oral skills, specially speaking, which might indicate a misconception in educational policies in Brazil regarding what a proficient learner should be able to do in a foreign language. We suggest this misconception also exists in different levels of education. During primary and secondary school, linguistic policies in Brazil strongly recommend the development of reading skills (at the expense of others). The result of this policy is that when students reach university level they do not have a good level of fluency in English and can at most, read in that language. So as to correct this deficiency perceived in the development of oral skills in English, the Brazilian government launched the EwB program whose aim was to correct this deficit through the MEO course and face to face classes. However, the analysis made here suggests that the MEO falls short of meeting that goal in itself and must be offered together with face to face classes if it is to improve the fluency of Brazilian students and their overall proficiency level in English. Since the MEO course is available for free for all public university students but the face to face classes are limited to a certain number of vacancies per institution, one suggestion is that the face to face classes are expanded so as to reach all university students. In addition, in order to reach the greater aim of internationalization of Brazilian higher education, and taking into account the shortcomings regarding MEO discussed in this article, we believe Brazilian foreign language and internationalization policies should undergo a major restructuring to include the development of productive skills in the target language in primary and secondary schools and the recognition of the role of English as an international language.

Regarding the usability features of the software, results point to the conclusion that the lack of feedback focused on pedagogic hints rather than on technical ones is a negative feature of the course analysed. These results reveal a fragile relationship between the pedagogic and ergonomic characteristics of the software, which is likely to hinder the development of EFL proficiency. Taken

together we can say, by way of concluding, that the EwB program is a relevant internationalization program and important step to drive internationalization in Brazil forward but it must be improved in at least three ways: (i) offer the actions of the program sooner, for basic education and not only for university students; (ii) offer face to face classes to all students and not only to a limited number of students per institution and, (iii) improve the online course (MEO) so as to provide pedagogic feedback and the possibility for the development of productive skills. Finally, evidence gathered so far supports the claim that the critical use of technology aligned with educational and linguistic policies seems to be necessary to combat the perceived lack of English language proficiency of Brazilians which in turn affects and is affected by the internationalization and social development in that country.

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## APPENDIX 1

Questions of the first questionnaire: How old are you? In which university do you study? Which course are you taking? In which term are you enrolled at? Do you have a computer or a laptop at home to study at MEO? Before MEO, have you ever studied English? For how long? In a public or in a private language school? How long have you been enrolled at MEO? Have you taken the placement test? In which level have you been placed? In which level are you at this moment? What is your general opinion about the virtual learning environment of MEO? Do you believe MEO is helping you to improve your English? Do you believe that taking an online course is enough to learn a language? Which activities do you consider the easiest and the most difficult ones in the virtual learning environment and why?

## APPENDIX 2

List of usability criteria assessed through the second questionnaire

1. *Promptness*: the software leads the user during the interaction (performance of the tasks), by clearly showing the actions that can be executed, as for instance, by indicating the adequate format and acceptable values in which data should be entered in the system (example: MM/DD/YY; \_\_\_\_\_ miles)
2. *Grouping by location*: the items of the software (texts, images, icons, commands, etc.) are presented in a logic functional way (for example: in alphabetic order, by frequency of use), thus facilitating the comprehension of the screens by the user.
3. *Grouping by format*: in a screen in which several options are available for the user (for example, [CONFIRM], [CANCEL], [COPY]), the most probable one is shown in a distinguishable format (for example: [**CONFIRM**]).
4. *Feedback*: the software provides in a fast and consistent way an answer to each action requested by the user. For instance, by showing data that is being inserted at the moment; by showing when the system is processing information; by offering the user a summary of the activities performed, hits and misses.
5. *Readability*: the software presents information taking into account the perceivable characteristics of the user, as for instance, the use of dark letters in a clear background, balance between capital and lower case letters, centralized titles, limited use of hyphens and syllabic separation.
6. *Concision*: the software presents information (texts, commands, advising messages) in a concise way without making the interaction with the user too long.
7. *Minimal actions*: the software requires minimal actions from users to accomplish the tasks.
8. *Informational density*: the software screens present only necessary data and information, indispensable to users in each specific task, without showing a great number of windows (and/or other pieces of information) that may distract the focus or overload user's memory.
9. *Explicit actions*: to start data processing, the software requires from users a specific action such as [ENTER]. The software allows the user to take over navigation among the fields to be fulfilled.
10. *User control*: the software allows users to control the pace of data entries, permitting the interruption or canceling of any ongoing action if users wish so.

11. *Flexibility*: the software allows the user to adapt the system interface to their particular necessities, as for instance, by personalizing screens, colors, document formats, among other configurations.

12. *User experience*: the software allows for the execution of tasks in several ways, taking into account users' level of experience, besides providing varied forms of presenting the same piece of information to different types of users: beginners and more experienced ones. The software also allows more experienced users to replace the use of the mouse by specific commands or keyboard shortcuts.

13. *Error protection*: the software offers opportunities to error prevention, such as, by requiring the confirmation of users' actions that may lead to data loss; by emitting audio signals when problems with data entry in the system occur; by impeding users to enter inadequate data or information in specific fields of the system.

14. *Error message*: error messages provided by the software to the user are clear, task-oriented, specific, brief, use common vocabulary, and are not rude. Error messages offered by the software also help users to solve their problems, by precisely providing the location and the specific (or probable) cause for the error, as well as the actions the user can execute to correct it.

15. *Error correction*: the software offers opportunities for users to correct errors, by making it possible to undo or redo the incorrect data entry.

16. *Consistency*: the icons, commands, color codes and data presentation are patterned, that is, their format and place are consistent (stable) from one screen to the another, or from one section of the system to another.

17. *Meaning*: codes such as titles, denominations for menu options, advising messages, abbreviations, among others, are used by the software in a clear, pertinent and meaningful way to users, thus avoiding the selection of wrong or undesired options.

18. *Compatibility*: proceedings for the executions of tasks in the system are compatible to the users mental model, that is, meet what they believe it to be or their habits and expectations. For example, the date format of the user's country; familiar vocabulary; text presentation following the conventions for written texts, among others.