ENGAGEMENT FACTORS AND MOTIVATION IN E-LEARNING AND BLENDED-LEARNING PROJECTS

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ABSTRACT

Virtual education is one of the most significant tools in what EU Commission calls *Lifelong Learning (LLL),* and learners' engagement is a capital aspect to succeed in any online formative activities. Therefore, this paper is devoted to reach three main objectives to improve virtual formative experiences:

- Identifying which motivational factors are more significant in e-Learning/blended-learning processes as well as in technology-supported on-campus teaching.
- Discovering which kinds of digital and 2.0 tools for creating multimedia educational resources are best considered according to their capacity to keep students engaged in virtual educative projects.
- Clarifying which types of learning products (that is, e-assessments) are most suitable to help e-learners acquire good quality knowledge along with practical competences while keeping motivation throughout the course.

In order to achieve these aims, it was developed a research process focused on the aforementioned subjects and based on building a specific questionnaire with 36 questions (in four sections) about motivation in e-learning, keeping in mind the conclusions derived from a previous literature review.

This questionnaire was filled in by 65 experts on e-Learning and hybrid teaching (mainly from Spain and South America) whom were connected by emailing.

After applying qualitative statistical analysis to their responses, several interesting conclusions came up, such as:

- Awakening students' sensible curiosity by means of a suitable diversity in how contents are presented will improve grades and levels of satisfaction.
- Including an equalitarian and integrative internal motivational system will increase engagement and retention.
- Accessibility is a key point in relation to how e-learners get engaged in an educative project and get benefits from it. This is particularly important in the early stages of the course.

And some other evidences that are described in the paper. This research will be useful to develop new instructional design models centered in getting and keeping e-learners' attention and motivation through involving new techniques like *gamification* or creative problem-solving activities. Besides, these results will help educators discover the main factors they should pay attention when designing e-learning tasks and selecting web 2.0 tools for the 21st century students.

Categories and Subject Descriptors

K.3.1 [**Computers and Education**]: Computer Uses in Education – *collaborative learning, computer-managed instruction, distance learning*.

General Terms

Performance, Design, and Human Factors.

Keywords

Multimedia educational resources, e-Learning engagement, Computer-managed instruction, e-Learning motivation and e-assessments.

1. CONTEXT AND JUSTIFICATION

Two of the most common barriers detected when carrying out educational initiatives partially or fully online *(blended* and *e-learning*, respectively) are the progressive discouragement process of students and their disinterest or lack of real commitment to the formative project.

A serious problem, first because it affects the educational benefits that the learner gets from his/her participation in the proposal, last and essential purpose of any training initiative. And second, because these facts affect the reputation of virtual education as a useful and effective facilitator of learning and a mechanism to increase teaching quality.

According to Istanbul Declaration (2002) [1] and Alexandria Declaration on Information Literacy (2005) [2] training digital skills is essential for a citizen to participate adequately in the Society of Knowledge. Online education is an optimal tool for familiarizing with technological environments as well as for skills developing in an autonomous and progressive process.

Similarly, the European Union in its White Paper on Education and Training (1995) [3] establishes one indispensable priority: ending the digital break among generations and raising public awareness on the need for ongoing formation throughout life (i.e. *Lifelong Learning*, hereinafter *LLL*). E-Learning training is an indispensable means to reach such objectives for its logistical,

economic and educational advantages. A training methodology that is also a key element in social inclusion programs as highlighted in the White Paper on Intercultural Education (2010) [4].

A level of quality recommended in the Book of Good Practice in e-Learning (2007) [5], which will be compromised if not identified, analyzed and modified those factors that may encumber their advantages and influence their efficiency in a bad way.

Learning has both a single and a social component that contribute to the development of operational autonomy and self-management process [6]. Learning should always be contextualized and its objectives and usefulness must be easily identifiable [7]. Besides, since learning involves a relationship and is not limited to formal and planned education, then any social context can be considered a learning environment [8]. Therefore, those environments created by new technologies favor a change in the conception of learning (and teaching); and they also influence learning deployment as new learners not only consume content but actively participate in a self-managed way [9 and 10].

An independent student develops a three-phased sequential process: planning, monitoring and evaluating [11]. And it runs through a duty cycle of 6 basic steps: selection of objectives, setting of goals, development and maintenance of effort toward a particular purpose, interpretation of the partial results, establishing new priorities and achieving those goals [12].

A learning process from surface to deep where the initial data and information will be processed and internalized to result in the Knowledge or Wisdom. This process requires a high level of commitment and dedication; a level that can only be maintained if the learner is sufficiently motivated.

Connectivist and *sharist* pedagogy that promotes: collaborative work and student socialization, the role of teachers as mentors and an appropriate range of learning tasks with gradual level of difficulty (proportional to the improvement in the skills of students) have proven useful in reducing dropout rates of proposals and improving learners' level of engagement. However, motivation levels still need to be strengthened in order to keep learners inside an area of optimal performance (or flow channel) [13, 14 and 15] to maximize its beneficial use, to focus their attention and to strengthen their commitment.

In such mission, interactive multimedia instructional contents, designed with digital tools or instruments 2.0 contribute favorably. A contribution that is favored by the development of learning tasks whose products (that is, e-Assessments) are sufficiently varied to stimulate different intelligences of learners and involve the use of ICT for their development.
Both elements may reinforce that motivation in learning that combines the three groups of traditionally identified factors: extrinsic, intrinsic and transcendent [16 and 17]. In the words of Wlodkowski:*"Motivation is not only important because it is a necessary and essential causal factor for learning to occur, but because at the same time is a consequence of learning*" [18].

2. OBJECTIVES

Within a research on motivation in virtual and hybrid learning (blended and e-Learning) and influence of the introduction of techniques for Game-Based Learning (hereinafter GBL) on the level of commitment and engagement of learners, we wanted to know expert opinions regarding the obstacles identified in the design or development of training proposals for *e-/b-Learning* and their recommendations to overcome them and improve the quality of their work.

Specifically, there were three complementary objectives related to the central theme of this paper:

- Identifying which motivation factors are more significant in e-Learning/blended-learning processes as well as in technology-supported on-campus teaching.
- Discovering which kinds of digital and 2.0 tools for creating multimedia educational resources are best considered according to their capacity to keep students engaged in virtual educative projects.
- Clarifying which types of learning products (that is, e-assessments) are most suitable to help e-learners acquire good quality knowledge along with practical competences while keeping motivation throughout the course.

3. RESEARCH: METHODOLOGY, SCHEDULE and DESCRIPTION

As it is shown in **figure 1**, there were two stages in this research:

1. **Review of scientific literature** in order to:
   - Identify the most influential motivational factors in learning-teaching processes.
   - Analyze the main models and theories on motivation in learning.
   - Select those methodological recommendations and design strategies whose action on learners' motivation is significant enough.
2. Afterwards, with the intention of contrasting the conclusions from the prior stage, an **empirical research** was developed as to accomplish two objectives:
   - **Main goal:** Identify those motivational elements - intrinsic and extrinsic factors- which are considered most meaningful in virtual and hybrid learning as well as in technologically assisted on-campus learning, as well as finding those ones perceived as most suitable to be enhanced by playful techniques.
   - **Secondary goals:** Discover learning experts' opinions on the motivational influence of: tools for creating multimedia learning materials, types of assessments, learning tasks and characteristics of learning contents.

The design and main characteristics of the empirical research stage are summarized in **figure 2**. As it is presented in this diagram, in order to reach the aforementioned objectives, a specific questionnaire was designed following a logical deductive sequential procedure and applying a thematic aggregation of questions [19, 20, 21, 22 and 23].
That questionnaire was finally structured in five parts with 36 questions distributed as it can be seen in **table 1**:

- Heading: Objectives, general overview and instructions.
- First section: Socio-labor profiles.
- Second section: On-campus teaching and digital learning materials.
- Third section: e-Learning/blended-Learning, motivation and GBL.
- Fourth section: Motivational factors in virtual teaching/learning.

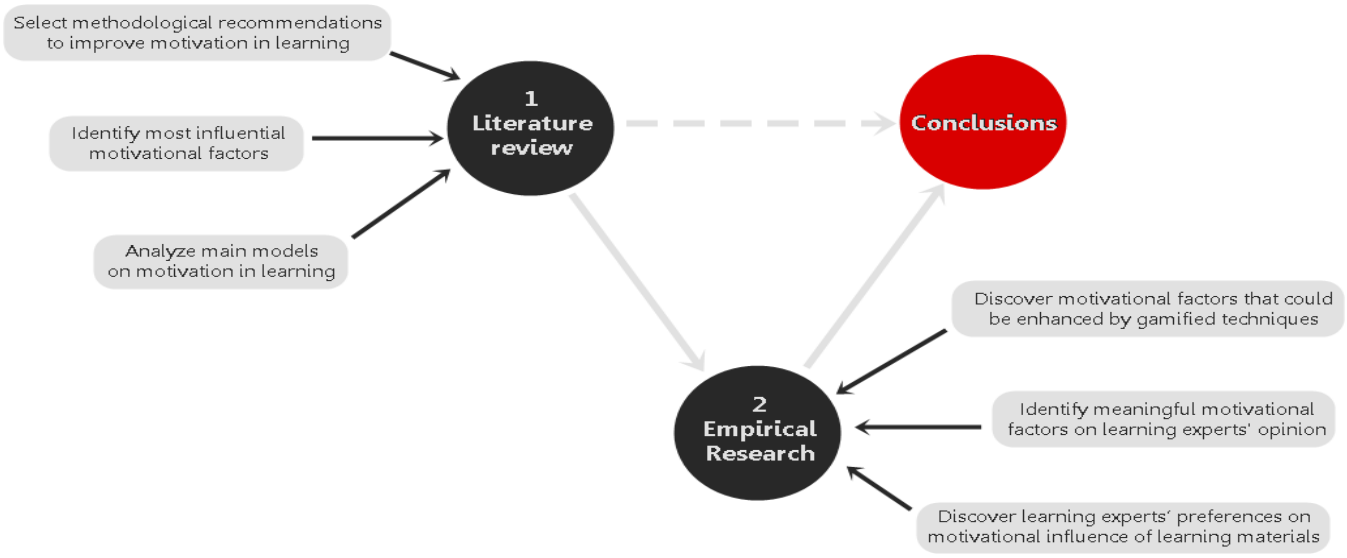

Figure 1. Full research process schedule. Source: Authors' own work.

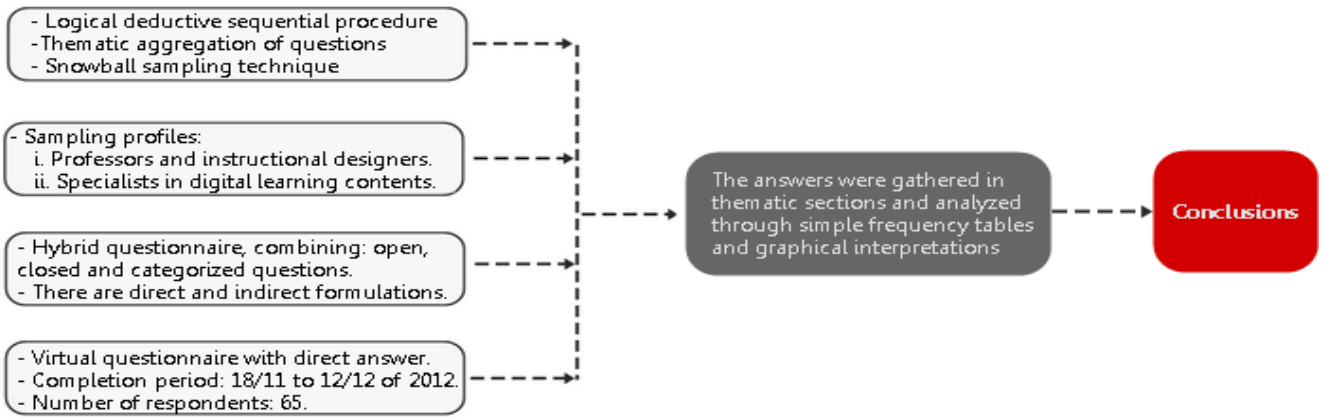

Figure 2. Stage 2, empirical research: Design and characteristics.
Source: Authors' own work based on (García, 2003; Hernández., 1997; Osorio, 2001; Wright & Rosenbaum, 1979).

This survey was sent by mail to the selected respondents (around 100 individuals) and 65 out of them answered it from the 18Th of November to the 12Th of December of 2012. They were mainly from Spain and South America and their main professional profiles were:

- Teachers, professors, instructional designers and formative consultants with at least 10 own blended/e-Learning projects (> 30 hours/each), and
- Experts on creating digital learning resources in different scientific and technical brands with at least 3 years of experience.

Thematic section	Number of questions	Type of questions
Socio-labor profiles	4	- Open, closed and categorized - Direct - Factual and identification questions
On-campus teaching and digital learning materials	7	- Open, closed and categorized - Direct - Factual and opinion questions
e-Learning / blended-Learning, motivation and *GBL*	13	- Open, closed and categorized - Direct and indirect - Factual, opinion and intention questions
Motivational factors in virtual teaching/learning	12	- Open and closed - Direct - Factual and opinion questions

Table 1. General overview of the questionnaire and types of questions. Source: Author's own work.

In the aforementioned questionnaire there were 8 questions related to:

- Learning motivation and engagement in virtual or hybrid educational projects,
- Influence on motivation from different digital resources and web tools for creating multimedia formative contents, and
- Level of reinforcement in motivation coming from different kinds of e-assessments,

Four of them were open questions, two closed and other two categorized questions. The results for each one of them are shown in the following section.

- Question II.5: *Please, evaluate the following learning multimedia resources according to their level of influence on improving learners' motivation and engagement. (Mark U, Unknown, for those you have never used so far).*
  Liker scale: Poor, Suitable, Very Suitable, Unknown.

- Question II.6. *Please, let us know what your definition for encouraging and engaging Education is.*

- Question II.7. *According to your opinion, which are the five most significant motivational factors in virtual education?*

- Question III.3. *According to your experience, please, evaluate the following types of e-assessments keeping in mind their level of motivation reinforcement (Mark U, Unknown, for those you have never used so far).*
  Liker scale: Low, Medium, High, Unknown.

- Question IV.1. *Please, mark those motivational factors that you consider to be more significant in turning a learning project into a successful initiative.*
  Section IV.1. *Intrinsic Factors*.
  1. *Procedural-Methodological Factors*.
  2. *Human Factors.*
  Section IV.2. *Extrinsic Factors.*

- Question IV.2. *Please, let us know, according to your experience, which the five most relevant motivational factors are, out of the ones that are already included in the previous question.*
  Section IV.1. *Intrinsic Factors.*
  Section IV.2. *Extrinsic Factors.*

In relation to the codification of the responses, two groups of techniques were applied:

i. Closed and categorized questions: It was applied a "*prior-encoding*" method by assigning a number to each item in the question (*Descriptive Codes*).

ii. Open questions: An inductive or "*following-encoding"* technique by means of textual analysis of free short answers with a Key Word in Context (KWIC) method. This way, leitmotivs and causal relationships will be identified and it will make possible establish their respective codes (*Inferential Codes*).

4. RESULTS

Figures 3 to 8 show the results -charts and frequency tables- for each of the issues in the areas referred to in the overall study developed.

a. Question II.5: *Please, evaluate the following learning multimedia resources according to their level of influence on improving learners' motivation and engagement.*

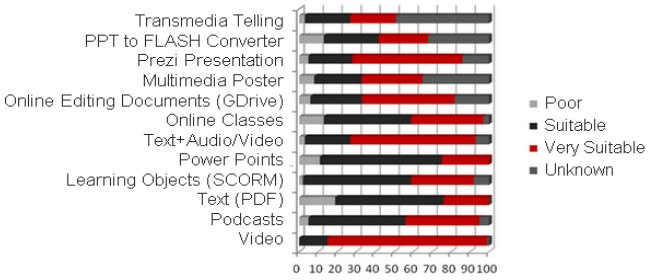

Figure 3. Bar graph: results from Question ii.5. Source: Authors' own work

Having a look at this graph, it can be realized that *Video* and *mixture of audio/video and text* are far considered the most appropriate training resources. The following ones are "innovators" such as "*Prezi presentations"* and "*Online editing documents"* (i.e. Google Drive, SkyDrive and the like). The last are particularly highlighted due to their ability to make collaborative and cooperative work come true. *Learning objects* (i.e. SCORMS) and classical *"PowerPoint"* are also perceived as suitable means, but "simply" suitable.

b. Question II.6. *Please, let us know what your definition for encouraging and engaging Education is.*

The results for this question are shown in **Table 2** and **Figure 4**.

When the matter comes to define engaging and encouraging Education, many respondents agreed on the fact that student-centered learning environments capable of awaking learners' curiosity and focused on building strong tutor-apprentice relationships are the most appropriate means to offer a meaningful learning experience.

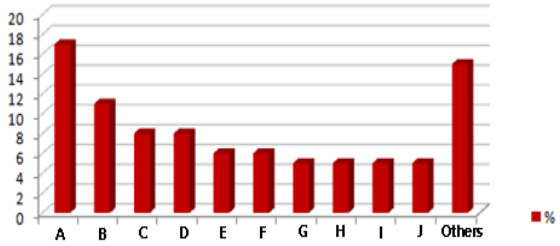

Figure 4. Bar graph: results from Question ii.6. Source: Authors' own work

Table 2. Absolute frequency table of categories identified in Question ii.6. Source: Author's own work

	Category (*Leitmotiv*)	Frequency	% of total responses
A	Encouraging participation and involvement of students making them central to the process	11	17
B	Awaking learner's curiosity	7	11
C	Allowing meaningful learning	5	8
D	Encouraging tutor-student interaction	5	8
E	The teacher acts as a guide and motivates students	5	8
F	It really impulses Lifelong Learning	4	6
G	Encouraging creativity and motivating learners	4	6
H	Encouraging collaborative construction	4	6
I	Methodologies are active and flexible	3	5

c. Question II.7. *According to your opinion, which are the five most significant motivational factors in virtual education?*

After applying the method KWIC, the resulting elements were grouped into six thematic categories: *Instructional Contents, Learners, Teachers, Methodology, Design of Materials and Learning Environment*.

The general distribution of the motivating factors in each of the conceptual categories is shown in **Figure 5** and **Table 3** where they are organized in decreasing order.

Table 3. Distribution of motivating factors in the categories identified in Question ii.7. Source: Authors' own work

	Category (*Leitmotiv*)	N° Factors	% of total responses
C	Learners	78	24
B	Teachers	75	23
D	Methodology	63	19
A	Instructional Contents	58	18
E	Design of materials and assessments	32	10
F	Learning environment	19	6
	TOTAL	**325**	**100**

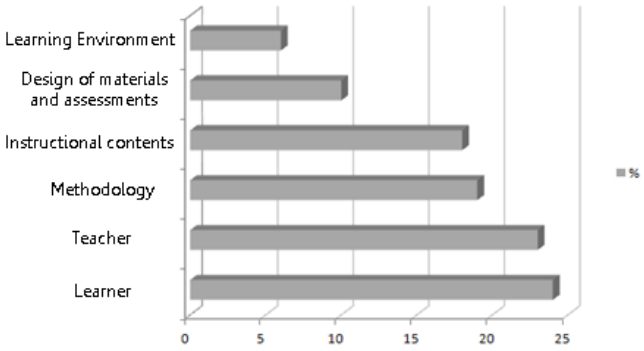

Figure 5. Bar graph of the categories of motivating factors identified in Question ii.7. Source: Authors' own work

Paying attention to the prior data, it can be said that those components associated with teacher and learner roles as well as the quality of the educational methodology and instructional content.

The breakdown of the most common factors identified by the respondents for each one of the six categories aforementioned is presented in **Table 4** (Next page). In every cell, those factors are ordered according to their progressive level of relevance/significance (their percentages are shown along with them).

d. Question III.3. *According to your experience, please, evaluate the following types of e-assessments keeping in mind their level of motivation reinforcement.*

According to **Figure 6** (Next page), synthesis and exposition of conclusions in forums are the best reinforce for motivation levels following by interacting in social networks and reflecting in blogs. The three of them are focused on socializing and training critical thinking and they all are tasks in the highest levels of Bloom's taxonomy.

The results for the rest of choices are pretty similar, being audio files and mural-*infographics* the ones whose impact is perceived as lower.

e. Question IV.1. *Please, mark those motivational factors that you consider to be more significant in turning a learning project into a successful initiative.*

- Section IV.1. Intrinsic Factors.
- Section IV.2. Extrinsic Factors.

Those motivational factors that have been especially remarked by respondents (Percentage of affirmative answer to its motivating capacity was greater than 85%) from the list built after the previous literature review is given in **Tables 5 and 6** (Following to next page)**,** grouped into the categories created in the questionnaire.

Table 4. Motivation Factors identified in Question ii.7: Breakdown. Source: Authors' own work.

Motivation Factors identified in Question ii.7	
Category 1. Instructional content	**Category 2. Teachers**
• Flexibility (4%). • Suitable contextualization and study guides (10%). • Updating level (10%). • Simplicity and clarity in their organization (15%). • Relevance and professional interest (30%). • Applicability and helps for personal development (37%).	• Professional competence and good experience (7%). • High level of teacher-student interaction (15%). • Innovation and creativity (15%). • Good communication skills and ability to convey passion for learning (20%). • Customizing of learning and appropriateness to the student's Zone of Proximal Development (27%). • Favorable affective attitude and professional ethics (30%).
Category 3. Students	**Category 4. Methodology**
• Development of metacognitive strategies (4%). • Positive feedback and recognition of achievements (7%). • Proof and effort (9%). • Perception of teacher involvement (10%). • Perceived level of challenge (12%). • Willingness, initiative and desire to learn (15%). • Balancing expectations and compliance (15%). • Interaction and socialization (19%). • Particular interest and level of involvement (25%).	• Targeting multiple intelligences (5%). • Logical Significance (7%). • Psychological Significance (10%). • Prior leveling and proper sequence of activities (12%). • Cooperation and collaboration (15%). • Rigorous planning and instructional design that promotes significant learning (18%). • Inclusive methodology and innovative dynamics (27%).
Category 5. Design of materials and assessments	**Category 6. Learning environments**
• Reusability (7%). • Portability (7%). • Interactive character (17%). • Multimedia design (17%). • Innovative character (24%). • Attractive graphic design and accessibility (29%).	• Family expectations about the outcome (30%). • Environmental conditions of study rooms (45%).

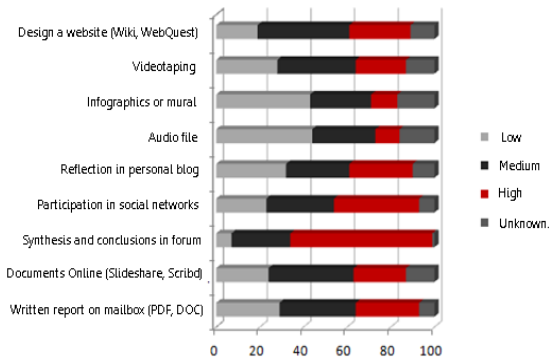

Figure 6. Bar graph: results from Question iii.3. Source: Authors' own work.

Table 5. Intrinsic motivation factors. Source: Authors' own work.

1. Intrinsic Motivation Factors		
1.1. Procedural-Methodological Factors		
A. Intrinsic interest of the proposal	**B. Proposed value**	
• Allows meaningful learning • Variety and novelty of tasks, • Conceptual, procedural and attitudinal coherence • Existence of sequential thread • Appropriate degree of challenge and difficulty • Capacity in retaining attention • Ability to arouse interest and curiosity • Nurturing creativity • Being innovative	• Applicability in job environment • Utility of outcome • Significance of the tasks in the learning process • Perception of capacity of tasks for skills development • Interactive tasks • Linking to learning objectives	
1.2. Human Factors		
A. Attitude	**D. Esteem**	
• Involvement degree • Initiative and willingness to learn • Attitude towards learning in general • Attitude towards the goals and skills • Attitude towards cooperative tasks • Attitude towards individual effort	• Balancing difficulties and expectations • Realistic perception of personal ability and available time • Capacity for independent learning • Nature and contents of feedback • Confidence in personal skills to overcome challenges • Ability to schedule own time	
B. Emotional Control	**C. Domain**	**E. Other human factors**
• Control of anxiety for the unknown and novelties • Development of feeling of belonging	• Feeling the development of skills and competencies • Feeling that acquired knowledge is being applied • Self-efficacy in problem solving • Perceiving that similar situations will be controlled afterwards	• Perceived teachers involvement • Opportunities for personal development

Table 6. Extrinsic motivation factors. Source: Authors' own work.

2. Extrinsic Motivation Factors		
2.1. Learning environment	**2.2. Social components**	**2.3. Features of interactions with others**
• Participatory and dynamic methodology • Tutorial functions • Attractive and updated content • Realistic, coherent and flexible planning • Scaffold and tools to help • Students enjoy that environment • Tutors' communication skills • Design and usability of the virtual classroom	• Sense of belonging to a learning community • Opportunities of professional advancement	• Caring, committed and generous attitude • Quality of communication within work teams • Ability to reduce tension and conflict degree • Respect for other group members • Knowledge exchange • Personal experiences exchange

f. Question IV.2. *Please, let us know, according to your experience, which the five most relevant motivational factors are, out of the ones that are already included in the previous question.*

i. Section IV.1. Intrinsic Factors.

As it is shown in **Figure 7**, there is a great variety of factors among the collected responses inside the intrinsic motivation field. Three of them must be particularly remarked: "Perception of capacity of the task to develop skills", "Utility of outcomes" and "the fact that most students feel that their skills are being trained". Their joined frequencies are around 30% out of the global responses.

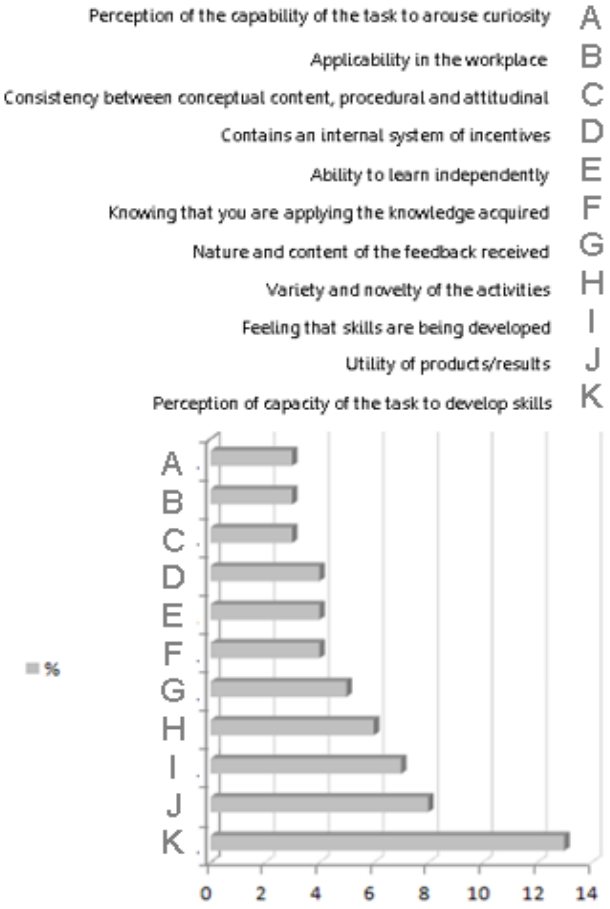

Figure 7. Bar graph: results from Question iv.b.2.A. Source: Authors' own work

ii. Section IV.2. Extrinsic Factors.

Regarding the extrinsic factors, **Figure 8**, it must be said that building an actual learning community where knowledge and experience are interchanged and the quality of teaching performance are key points in keeping learners motivated throughout the full training project. After them, the characteristics of the instructional content and the design of the interface of the virtual learning platform are listed as pretty significant elements to take into account.

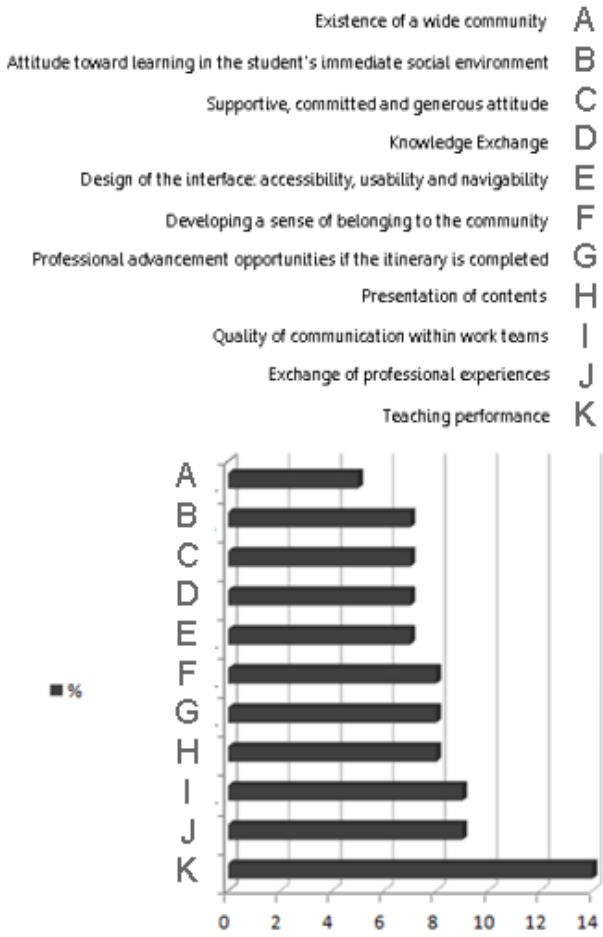

Figure 8. Bar graph: results from Question iv.b.2.B. Source: Authors' own work

5. CONCLUSIONS AND FUTURE RESEARCHES

Keeping in mind the results from this prospection, it is clear that cognitive overload and an excessive variety of formats in training materials discourage most learners. Besides, contents that properly help develop critical and reflective capacity must be provided since those learning tasks that involve these skills are considered the most suitable to improve motivation levels.

It is needed to include innovative activities in e-Learning or blended-Learning proposals as well as design them setting as a key objective the customization of the overall formative pathway. On the other hand, by integrating the full process into a context that facilitates and enhances its positive effects and fixing a difficulty level suitable for most prior levels in students are two good strategies to improve motivation.

By arising sensitive curiosity in students through a suitable diversity of instructional materials (in diverse formats), associating their specific objectives with the real needs of students and giving those some control over the learning pathway, the level of engagement is really favored. In fact,

offering an appropriate number of meaningful choices is seen as an essential part of any motivating proposal.

In order to enhance learning retention more efficiently, visual materials (videos, LOs) must be preferred to purely textual ones. Moreover, according to the majority of respondents, by including a high variety of learning tasks (enough as to avoid monotony and boredom), aligning all elements to strengthen the psychological significance of the project and involving processes seen as useful for the learner, motivation may be improved in e-Learning activities.

Talking on external factors, socialization must be actively promoted as to prevent discouragement, especially in the early stages as this usually is a key in the decision to leave the course. Along with this, integrating a balanced, integrate and inclusive reward system can be seen as a nice reinforcement; however it must be perceived as fair by learners in order to avoid discouragement because of its inequity.

When the matter comes to teaching, by promoting participatory realistic dynamics that stimulate personal initiative and providing proactive, positive and constructive feedback on progress –focused on the future-, effective learning is harnessed.

Accessible, interactive and easy-to-navigate instructional contents are identified as the best resources to encourage learners and improve their personal development and skill training with the educational e-project.

Interrelationships among all agents in any training proposal seem to be considered as a useful resource to improve how learning is transferred to extra-academic contexts.

By offering logically structured contents that are internally consistent, linking new materials to learners' previous knowledge and experience as well as breaking down the main goals into minor achievable objectives, are remarked as good techniques to increase the representativeness of what is going to be learned.

Those educators, who actively take part in the virtual environment like mentors and highlight the human touch in e-Learning proposals, are capable of positively influencing most learners' attitude toward the course and increasing the linkages between instructional content and apprentices.

5.1 Future Researches

Taking into account all these conclusions, it can be said that this research will be useful to develop new instructional design models centered in getting and keeping e-learners' attention and motivation through involving new techniques like *gamification*, project-based learning or creative problem-solving activities.

Besides, these results will help educators discover the main factors they should pay attention when designing e-learning tasks and selecting web 2.0 tools for the 21st century students. Along with web designers since they will realize which are the key points as to conceive a really accessible and easy-to-navigate virtual campus.

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