BIBLIOMETRIC STUDY OF MOTIVATION FACTORS IN HIGHER EDUCATION

Lourdes Canós-Darós[1], Eugenia Babiloni[1], Carlos García Gallego[2], Marcos García Gallego[2], Cristina Santandreu-Mascarell[1], Ester Guijarro[1]

[1]Departamento de Organización de Empresas. Universitat Politècnica de València (SPAIN)
[2]Departamento de Urbanismo. Universitat Politècnica de València (SPAIN)

Abstract

Motivation plays a crucial role in the teaching-learning process. Motivated students become active students who construct their own knowledge, a key element to achieving deep learning. For this reason, teachers are concerned about how can increase the motivation of their students. This topic has received increasing attention in academia. However, the majority of these works present a case study applied in a concrete context. In this paper, we reflect on how are, in general, the motivational factors that influence students' learning in higher education. To this end, we develop a bibliometric analysis and carry out a co-occurrence analysis of terms. Firstly, we specify our search by formulating the research question and defining our search. After applying the search criteria, 146 articles are analyzed. The main results of this study show that there is an interest in this topic, especially in technological and technic studies. The co-occurrence analysis identifies the most relevant terms and their relationships. In this analysis, 49 terms are identified and grouped in 4 clusters. With the aim to determine which of these terms can be considered motivational factors that influence students learning, a new co-occurrence analysis is developed. The result presents 45 motivational factors that are related to: (i) skills and attitude of lecturers, (ii) students' active role in their learning process, (iii) intrinsic characteristics of the students, and (iv) environmental elements.

Keywords: higher education, motivational factor, motivating teacher, student.

1 INTRODUCTION

Motivation influences students' academic performance and is an important teaching process. In fact, motivation plays an essential role in learning due to it enables students to engage and behave in a way that enhances their curiosity (Law, Geng and Li, 2019). This is why many teachers are concerned about the motivation of students in their courses. Concepts such as motivation, motivational factors, or learning motivation in a higher education context have increasingly been the subject of academic publications in recent years, not necessarily from a purely pedagogical point of view but also applied in different knowledge fields.

Motivation can be intrinsic or extrinsic. Intrinsic motivation is found within oneself and is associated with internal motivating factors, for example, the enthusiasm and pleasure experienced when performing a task. Extrinsic motivation is generated by friends, family, teachers, peers, etc., and is associated with external factors, for example, getting good grades or passing exams (Alt, 2015). If there are no intrinsic or extrinsic factors that motivate a student, he or she may experience problems such as anxiety, poor academic results, dropping out, etc. (Du Toit-Brits & van Zyl, 2017).

How can teachers motivate University students? On one hand, to maintain the interest and the active participation in learning (Rueda et al., 2020), they can use different dynamics and active methodologies (Iosup & Epema, 2014; Espinosa, 2016), avoiding the classic model of education that limits the interaction between students, teachers, and content. On the other hand, it is very important the attitude of teachers: optimist, confident, good communicator, motivator, accessible, understandable, patient, tolerant, didactic, orderly, and clear are considered characteristics that a motivating lecturer should have (Bono, 2010; Marín & Teruel, 2004). This is probably because the concept of motivation is linked to emotional intelligence and affective competencies (Goleman & Boyatzis, 2008; Bozu & Canto, 2009).

In this line, good practices for teachers are to promote making questions, dialogue, debate, cooperation, socialization of the findings, and construction of knowledge itself (De Zubiría, 2013). Other aspects such as developing creative and challenging academic tasks that increase student commitment (Varela et al. 2012) and developing activities that favor autonomy and motivation (Ten, Kusurkar & Williams, 2011) are also recommended to get a good motivation level in the students.

There is currently a debate on the comparison of the motivation of students taking online, blended or face-to-face courses. This is not the objective of this paper, as we consider student motivation in general, regardless of the fact that the learning environment is a valuable motivating factor (Tanaka, 2021). However, it has been shown that face-to-face learning is accompanied by higher learning motivation, whereby students tend to participate more actively in course tasks and group activities (Law, Geng & Li, 2019), which promotes self-directed learning (Du Toit-Brits & van Zyl, 2017) and improves their academic performance (Tan, 2020).

In this paper, we reflect on the motivational factors that influence the success of students in a course at the university level. We define the concept of motivation in an educational context and explain the influence of intrinsic and extrinsic motivational factors on students' learning. To achieve our objective, we apply a methodology that has been created ad hoc. First, we define our search and collect the sample. Second, we develop a bibliometric analysis of the papers published about these topics appearing on the Web of Science by using VOSviewer software and carry out a co-occurrence analysis of terms that appear in the abstract and author keywords. Third, we show and discuss our results, presenting a final list of motivational factors for University students.

2 METHODOLOGY

The methodology followed in this research is summarized in Fig. 1.

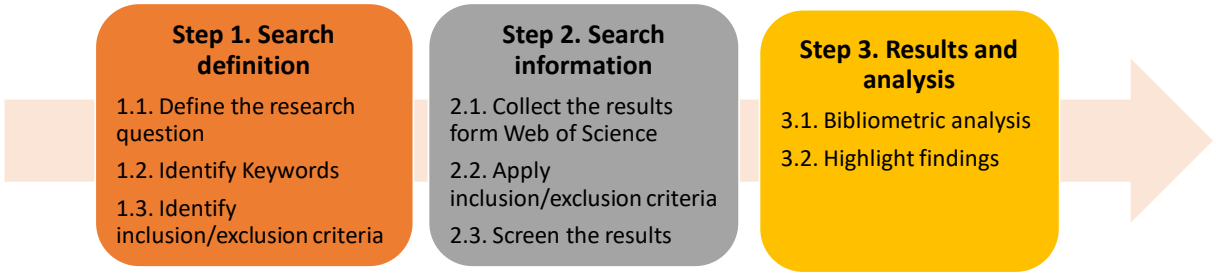

Figure 1. Methodology framework.

2.1 Step 1. Search definition

The question that this work focuses on is related to the factors that affect learning motivation in university studies. Therefore, the research question is **which are motivational factors that affect learning at university.** According to the research question, the following terms are applied in this sequence, adding the Boolean operator "AND": "**university**" AND "**learning**" AND "**factors**" AND "**students**" AND "**motivation**". For all of them, the field "topic" is selected, except for the "motivation" term, which is searched in the "title" field. Note that the topic field searches title, abstract, author keywords, and keywords plus. The last sub-step identifies the inclusion/exclusion criteria that allow selecting the research area: Education Educational Research; the type of document: article; and the language: Spanish or English.

2.2 Step 2. Search information

The search was carried out on the 21st of April 2022. Applying the keywords explained above to the Web of Science core collection, a total number of 386 documents were obtained. After applying the inclusion/exclusion criteria to refine the results, a total number of **146 articles** results from step 2.

2.3 Step 3. Results and analysis

After obtaining the sample for our research, a bibliometric study is carried out to identify the motivational factors. Specifically, the analysis consists of identifying: (1) the number of publications per year and most productive journals on the topic; (2) the most influential authors and creating a co-authorship and bibliographic coupling; (3) the different relationships between terms, the clusters of terms and its relationships through a co-occurrence map of terms. This analysis is carried out using the VOSviewer software, which provides a visual representation of the connection that exists between a set of scientific documents that are related to a previously defined topic. One of the analysis techniques provided by this software is the co-occurrence of terms. As a result, it provides a map or visual summary of the relationship and/or connection of the research field.

3 RESULTS

3.1 Bibliometric analysis

This section dedicates to presenting the most relevant results obtained after applying the bibliometric analysis. Fig. 2 (a) shows the number of publications per year. Note that the first articles appear in 1997. Furthermore, a positive trend is observed from 2012 (2 articles) to 2018 (24 articles), confirming the scientific interest in this topic over the last 5 years. From 2019 to 2021 the number of articles remains around 20, so it is still an important topic. Fig. 2 (b) summarizes the journals with more than 2 papers in our sample. According to this result, it seems that there is an interest in this topic in journals related to technical and technological studies.

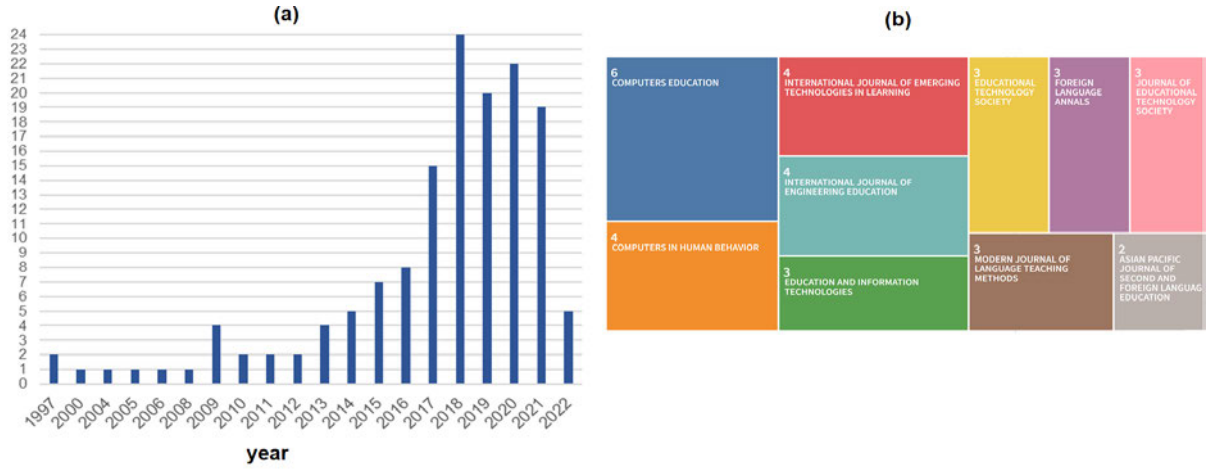

Figure 2. Number of papers per publication year and most productive journals.

To analyze co-authorship and possible clusters of researchers, we need to analyze the number of articles per author and the links between them. The first result is that there are a total number of 404 authors in our search. However, only 9 of them are authors of more than one article. As for the clusters, using VOSviewer we get 139 clusters of the 404 authors, which are not connected to each other (see Fig. 3). Therefore, the only result that can be highlighted is that there is no international connection between authors in this area. The 139 clusters seem to be the result of the usual collaboration between researchers who are not prolific in this subject. Therefore, despite the interest in this topic, there is no specific group of researchers specialized in the identification of motivational factors research.

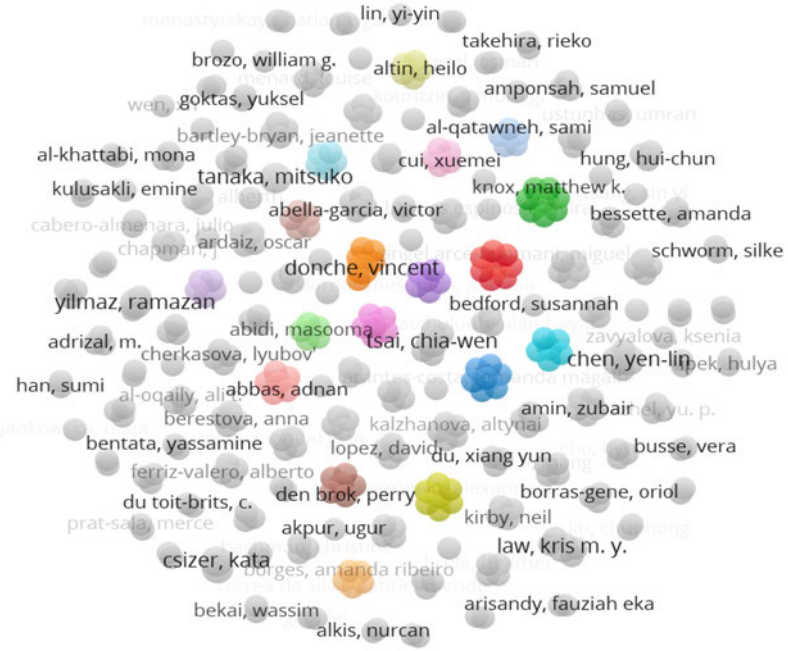

Figure 3. Co-authorship network.

In order to identify the most relevant terms and the relationships between them, a co-occurrence analysis of terms is carried out. Fig. 4 shows the result of this analysis, in which 49 terms are grouped into 4 clusters. Membership of each cluster is represented by the colors red (cluster 1) with 16 terms, green (cluster 2) with 14 terms, blue (cluster 3) with 11 terms, and yellow (cluster 4) with 8 terms.

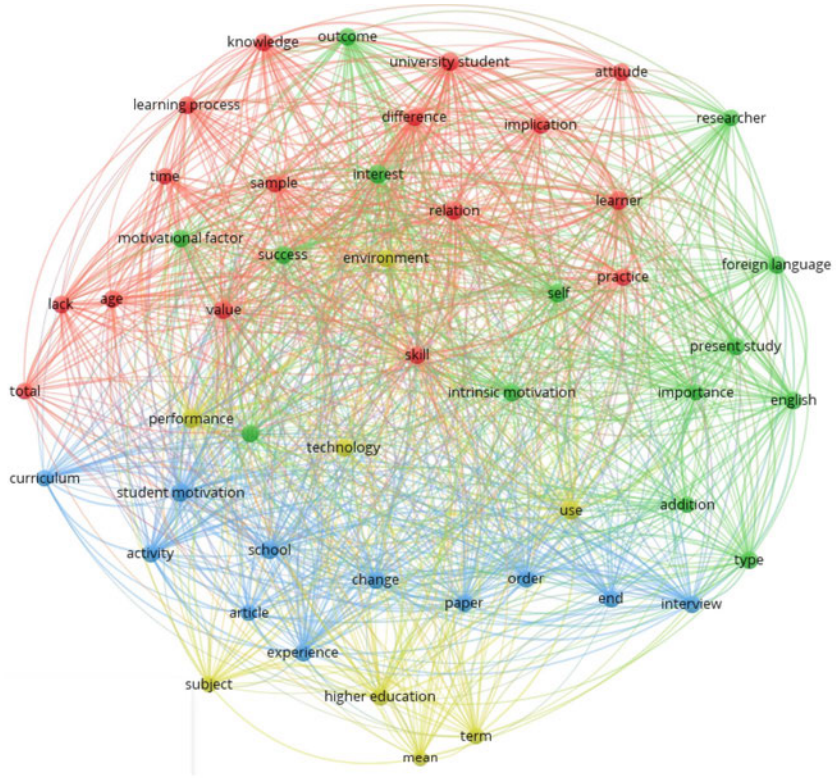

Figure 4. Co-occurrence map of terms in abstracts and keywords.

Table 1. Included terms in each cluster.

Cluster 1 (16 items)	Cluster 2 (14 items)	Cluster 3 (11 items)	Cluster 4 (8 items)
age	addition	activity	environment
attitude	english	article	higher education
difference	foreign language	change	mean
implication	importance	curriculum	performance
knowledge	interest	end	subject
lack	intrinsic motivation	experience	technology
learner	motivational factor	interview	term
learning process	outcome	order	use
practice	present study	paper	
relation	researcher	school	
sample	self	student motivation	
skill	self efficacy		
time	success		
total	type		
university student			
value			

The previous analysis points out the 49 most relevant terms related to motivational factors in higher education and establishes their relationships. However, the main objective of this research is not only to find the terms most present in the related literature but specifically which are the motivational factors that affect learning at the university level. To this aim, a new analysis is performed in order to identify

the co-occurrence between student motivation and the rest of the terms and their links (Fig. 5). As can be seen, not all the previous terms appear in this analysis. In fact, 45 of the total 49 terms show a direct relationship with the student motivation.

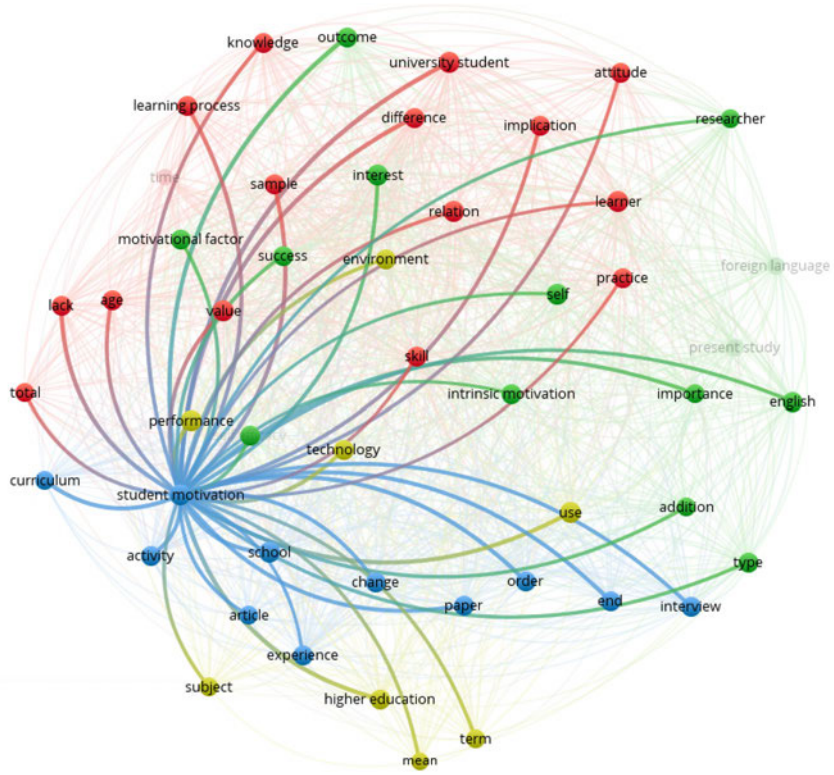

Figure 5. Links between "student motivation" term from the co-occurrence analysis of terms presented in abstracts and keywords.

3.2 Highlight findings

Previous analyses identify, on the one hand, the most relevant terms related to motivation factors in higher education and their relationships, and on the other hand, of all these terms, which ones show a direct connection with student motivation. However, it should be highlighted that not all these terms are necessarily motivational factors. In this sense, the term “technology” or “learning process” can be considered motivational factors, whereas terms such as “English” or “school” are not motivational factors indeed. Then, a deep analysis of these terms and their links allows us to present a list of motivational factors (Table 2).

Table 2. Motivational factors affecting students’ learning.

Cluster 1	*Cluster 2*	*Cluster 3*	*Cluster 4*
Age	Interest	Activity	Environment
Attitude	Intrinsic motivation	Change	Performance
Implication	Outcome	Curriculum	Technology
Knowledge	Self-efficacy	Experience	
Learner	Success		
Learning process			
Practice			
Skill			
Time			

According to Table 2, some common elements seem to have a direct connection to students’ motivation at the university level. On the one hand, the terms “attitude”, “implication”, “knowledge”, “learner” or “skill” show that aspects related to lecturers and their skills can influence positively the motivation of

students. On the other hand, we also find that students are motivated when they need to have an active behaviour for their learning (see terms such as “practice”, “activity” or “self-efficacy”), and these activities impact their results (see terms such as “outcome”, “success”, “performance”). Additionally, the characteristic of the student itself, such as “age”, “interest” or “intrinsic motivation”, seem to play an important role in his/her learning process. Finally, environmental elements (“technology”, “environment”, “time”) also seem to influence making students more motivated.

4 CONCLUSIONS

In the educational context, it is well known that motivation plays an essential role for improve students’ learning. Furthermore, it is crucial that students actively participate in their learning process as a way of increasing this motivation. In higher education, lecturers can improve and motivate learning by using different dynamics, avoiding the classic model of education that limits the interaction between students, teachers, and content. However, the role of the lecturers is crucial in this process. In this sense, when students talk about what motivates them on the part of the teacher, they do not refer to characteristics inherent to disciplinary knowledge, nor related to the pedagogical management of academics, both related to the competencies of knowledge and know-how of teachers.

From the point of view of the student related to the teacher, it can be said that a motivating teacher allows questioning, dialogue, cooperation, and any active process that allows students to construct their knowledge themselves (De Zubiría, 2013). On the other hand, Varela et al. (2012) suggest that a motivating teacher must be able to develop creative and challenging academic tasks that increase student commitment in their teaching-learning process, in an appropriate educational setting that favors autonomy and motivation (Ten, Kusurkar & Williams, 2011). Additionally, a motivating teacher should demonstrate an attitude of optimism and confidence towards the student, being important characteristics being a good communicator, motivator, accessible, understandable, patient, tolerant, didactic, orderly, and clear (Bono, 2010; Marín & Teruel, 2004).

In this paper, we reflect on the motivational factors that influence the learning process in higher education. To this end, we first carry out a systematic search in order to identify keywords related to students’ motivation. Second, we develop a bibliometric analysis of the papers published about these topics appearing on the Web of Science by using VOSviewer software and co-occurrence analysis. As a result of this search, 146 papers are analysed.

As a result, we find that this topic generates interest in academia, especially in the last six years, where we find an increase of papers published related to this topic (see Fig. 1(a)). Moreover, it seems to be a higher interest in technological and technical environments (Fig. 1(b)). However, despite this interest, Fig. 2 shows that there is not a group of experts in this field, but 139 clusters of authors that sporadically work on this topic.

With the aim of identifying the motivational factors that influence students’ learning, Fig. 4 and 5 present the co-occurrence analysis of terms present in the abstract and the author’s keywords. From this analysis, we find terms that have a relationship with student motivation. However, not all these terms can be considered motivational factors. Then, a more deeply analysis is carried out which is summarized in Table 2. This result shows that the student’s motivation is affected by different elements: the skills and attitude of lecturers, an active role in their learning, the intrinsic characteristic of the students, and finally, some environmental elements.

ACKNOWLEDGEMENTS

This research is supported by PIME 21-22/270 “Desarrollo y evaluación de competencias transversales a través de un proyecto multidisciplinar entre asignaturas de grado” from the Universitat Politècnica de València.

REFERENCES

[1] D. Alt, “College students’ academic motivation, media engagement and fear of missing out”, *Computers in Human Behavior*, vol. 49, pp. 111-119, 2015.

[2] A. Bono, “Los docentes como engranajes fundamentales en la promoción de la motivación de sus estudiantes”, *Revista Iberoamericana de Educación*, vol. 54, no. 2, 2010.

[3] Z. Bozu, P. Canto, “El profesorado universitario en la sociedad del conocimiento: competencias profesionales docentes”, *Revista de Formación e Innovación Educativa Universitaria*, vol. 2, no. 2, pp. 87-97, 2009.

[4] J. De Zubiría, “El maestro y los desafíos a la educación del siglo XXI”, *REDIPE Virtual*, vol. 825, pp. 1-17, 2013.

[5] C. Du Toit-Brits, C.M. van Zyl, “Embedding motivation in the self-directedness of first-year teacher students”, *South African Journal of Higher Education*, vol. 31, no. 1, pp. 50-65, 2017

[6] R. Espinosa, “Juegos digitales y gamificación aplicados en el ámbito de la educación”, *Revista Iberoamericana de Educación a Distancia*, vol. 19, no. 2, pp. 27-33, 2016.

[7] D. Goleman, R. Boyatzis, “La inteligencia social y la biología del liderazgo”, *Harvard Business Review*, vol. 86, no. 9, pp. 86-95, 2008.

[8] A. Iosup, D. Epema, “An Experience Report on Using Gamification in Technical Higher Education”. *Proceedings of the 45th ACM Technical Symposium on Computer Science Education*, pp. 27–32, New York: ACM, 2014.

[9] K. M. Law, S. Geng, T. Li, “Student enrollment, motivation and learning performance in a blended learning environment: The mediating effects of social, teaching, and cognitive presence”, Computers & Education, vol. 136, pp. 1-12, 2019.

[10] M. Marín, M. Teruel, “La formación docente universitario: necesidades y demandas desde el alumnado”, *Revista Interuniversitaria de Formación del Profesorado*, vol. 18, no. 2, pp. 137-151, 2004.

[11] S. Rueda, J. I. Panach, M. Gil, S. Casas, M. Pérez, “Cuando la clase invertida no es suficiente: estrategias para motivar al alumnado en Ingeniería del Software”, *Actas de las JENUI*, vol. 5, pp. 125-132, 2020.

[12] C. Tan, “The impact of COVID-19 on student motivation, community of inquiry and learning performance”, *Asian Education and Development Studies*, vol. 10, no. 2, pp. 308-321, 2020.

[13] M. Tanaka, “Individual perceptions of group work environment, motivation, and achievement”, *International Review of Applied Linguistics in Language Teaching*, 2021

[14] C. Ten, R. Kusurkar, G. Williams, “How self-determination theory can assist our understanding of the teaching and learning processes in medical education”, *Medical Teacher*, vol. 33 pp. 961-973, 2011.

[15] M. Varela, T. Vives, T. Fortoul, “La motivación: elemento indispensable en la formación de los médicos”, *Revista de la Facultad de Medicina UNAM*, vol. 55, no. 1, pp. 43-51, 2012.