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PERCEPTIONS OF BARRIERS TO PERSONAL CREATIVITY: VALIDATION OF AN INVENTORY INVOLVING HIGH EDUCATION STUDENTS

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Abstract

The topic of creativity in higher education has been increasingly emphasized as support to the social and technological innovation. This study presents the adaptation and validation of the Inventory of Barriers to Personal Creativity for Portuguese college students. The sample was composed by 582 students from a public university in Northern Portugal, whose ages ranged from 18 to 59 (M=23.41; SD=5.38), belonging to three main domains of graduation courses (Arts and Humanities, Social Sciences, and Sciences and Technologies). An exploratory factor analysis identified the four factors included in the original questionnaire: Inhibition/Shyness, Lack of Motivation, Lack of Time and Opportunities, and social Repression. The psychometric properties of the instrument are adequate, concerning internal consistency reliability and structural validity, for items and the four dimensions. Some guidelines are provided in order to use this questionnaire in future researches to increase the levels of creativity in teaching and learning processes in higher education.

Keywords: Creativity, barriers, university students, perceptions

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1. Introduction

Competition, uncertainty, unpredictability, change and consequent risk which are occurring at an exponential rate, are some of the characteristics that impact on current daily life and imply a perspective of a future marked by uncertainty and complexity. Consequently, the efficient management of this scenario requires not mere adaptation but especially the capacity to innovate (Adams, 2006; Beghetto, 2010; MacLaren, 2012). Creativity in order to be a resource of great value for individuals, organizations and societies, besides being an essential factor for innovation (Dewett & Gruys, 2007; Lubart & Zenasni, 2010), has been the target of a growing attention on the part of professionals and researchers in diverse areas (Runco, 2007; Starko, 2010).

2. Problem Statement

In higher education, current investment in creativity is becoming obviously indispensable. It is in this context that a highly specialized work force is being prepared for the knowledge society, where the mission of universities is to educate their students to make a decisive contribution to scientific, cultural, social and economic progress (Pachucki, Lena, & Tepper, 2010; Smith-Bingham, 2006). It is acknowledged to be insufficient to acquire or just to show knowledge. Now it is necessary to prepare for the constantly changing challenges, opportunities and obligations of contemporary society. Curricular learning is not enough. In all contexts of higher education investment has to be made in training students to be flexible and creative (Florida, 2003; McWilliam, Hearn, & Haseman, 2008). In this sense, Czikszentmihalyi (2006) indicates that while in the Renaissance period creativity could be a luxury for some, nowadays it is a necessity for everyone. In the words of Sternberg (2004), when considering higher education, being prepared for the future is above all “to have competencies to deal with life” (p.196).

Consistent with the need for innovation, the relevance of promoting a creative climate has been widely demonstrated. So, it is necessary to create conditions that allow for and strengthen creative expression not only in organizations in working contexts but also in education in general (Craft, 2005; Cropley, 2006; 2009) and particularly in higher education (Cropley & Cropley, 2009; McWilliam, 2008; Sternberg, 2004).

Such a climate of creativity is constituted by conditions external to the individual, as well as by individual conditions, where it is very difficult to establish frontiers between such complex and interactive variables (Sternberg & Lubart, 1995). Stimulating contexts at the cognitive, perceptive and interpersonal levels, guidance from tasks carried out fortunately by intrinsic motivation, incentives for and recognition of creative responses, the practice of self-

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regulation, autonomy and a high level of self-confidence, amongst many other things, are characteristics frequently pointed out as facilitators of creative expression (Amabile, 1996; Craft, 2005; Lucas, 2007). However, obstacles to this facilitation of creativity are also the object of warnings by various authors, who have called attention to distinct barriers to personal creativity, in other words, to factors that obstruct or make difficult the expression of the capacity to create. Amabile (1991) refers also to assassins of creativity taking an excessive control and the exclusivity of extrinsic rewards or competition. Specifically, in the school context these and others characteristics have been identified; namely, characteristics like intolerance to errors, premature closing of problems, deprecation of fantasies, ignorance about individual differences or the reinforcement of conformism (Craft, 2005; Cropley, 2009). Also, internal personal barriers to creativity have even been studied, thus emerging dimensions like lack of confidence in the values of his/her own ideas, fear of making errors, being ridiculed or being criticized, inflexibility, insecurity, internalization of restrictive beliefs and values about divergence and criticism (Alencar, 2001; Reis, 2003).

In higher education, some obstacles to creative expression have also been pointed out and, once more, internal and external barriers demonstrate tenuous frontiers. For example, Hargreaves (2008) emphasizes the fear of taking risks amongst university students and how this is consistent with a culture of fear in what should be a major virtue thus causing precaution rather than the lucid calculation of probabilities (Furedi, 2006). Myths surrounding what it is to be creative (such as it being a characteristic solely of talented individuals, having essentially hereditary causes, not requiring effort but only inspiration, etc.) also undermine academia in its relationship with creativity, according to MacLaren (2012). Referring to the conditions of the teacher practices, this author (MacLaren, 2012) comments that higher education "does not answer the basic requirement of Amabile for creativity to take place" (p. 164). From his viewpoint, Northedge (2003) points out that there is still an inherent conservatism in the attitude of his own university students concerning learning and some authors refer to stress in these students, as an eventual factor that constrains their creative expression (Bewick, Koiutsopoulou, Miles, Slaa, & Barkham, 2010; Wilcoxson, Cotter, & Joy, 2011).

3. Research questions

Nevertheless, research about creativity in higher education is still limited (Fryer, 2006; Kleiman, 2008). There have been few researches specifically about the self-evaluation of creativity in students (Balchim, 2005), which could be one of the reasons for putting forward the availability of evaluation instruments to fill this particular gap. The few

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instruments available that include factors for evaluating barriers to creativity are aimed at the identification of these obstacles solely in the working environment, like those developed by Amabile and Gryskiewicz (1989), Kwasniewska and Necka (2004) or Jones (1993).

This was one of the reasons that led Alencar to develop and validate the Inventory of Barriers to Personal Creativity (Alencar, 1999) for the Brazilian population, although initially intended for university students. The construction of this instrument was preceded by various studies in which an open technique was applied and which consisted in asking the participants to complete in the most honest possible way the sentence starting "I would be more creative if...". This technique was thought up by the authoress based on an exercise proposed by Necka (1992) for identifying solely internal barriers to the expression of any personal capacity for creation. This inventory has 66 items organized in the format of Likert responses (between "disagree completely" and "agree completely") and it involved four factors; namely, Inhibition/Shyness, Lack of Motivation, Lack of Time/Opportunity and Social Repression. The inventory has good psychometric qualities particularly regarding the percentage of variance of the results explained and regarding internal consistency (with alfas of Cronbach oscillating between .85 and 91).

In Portugal research about creativity in higher education is almost non-existent, as the instruments for evaluating the self-perceived barriers concerning creative expression have not yet been available until now. The objective of this study is then to present the steps for the adaptation and validation of the Inventory of Barriers to Personal Creativity (Alencar, 1999) for Portuguese university students.

4. Purpose of the Study

In Portugal research about creativity in higher education is almost non-existent, as the instruments for evaluating the self-perceived barriers concerning creative expression have not yet been available until now. The purpose of this study is then to present the steps for the adaptation and validation of the Inventory of Barriers to Personal Creativity (Alencar, 1999) for Portuguese university students.

5. Research Methods

5.1. Participants

Files should be in MS Word format only and should be formatted for direct printing. Figures and tables should be embedded and not supplied separately. The sample was made up of 582 students at a Portuguese public university, who were studying in three disciplinary areas: Arts and Humanities - with courses in Languages and Literatures, Portuguese and

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Lusophone Studies, Music, Architecture and Fashion Design (27% of the sample), Science and Technology - with courses in Mathematics, Statistics, Physics, Biochemistry and various Engineering specialisms (36% of the sample) and Social and Human Sciences - with courses in Education, Psychology and Communication (37% of the sample). This sample had 59 per cent of females and 42 per cent of males, who were attending either the Second Year of a Bachelor's Degree (67%) or the First Year of a Masters course (37%). Their ages ranged from 18 to 59 (M=23.41; SD=5.38).

5.2. Instrument

The study applied the Inventory of Barriers to Personal Creativity (Alencar, 1999), which was made up of 66 items using a five-point Likert scale format (ranging from "disagree completely" to "agree completely") for evaluating the perceptions of these university students about the personal and social barriers that inhibited their creative expression. Specifically, the study evaluated emotional barriers (e.g. "I would be more creative if people believed more in me"), difficulties related with time, opportunities and resources (e.g. "...if there was more time to put my ideas into practice"), obstacles of a social nature (e.g.: "...if I had not been limited by my family") and absence or low personal motivation (e.g. "...if I had more energy"). This instrument was revised in order to adapt the language to Portuguese spoken in Portugal by a professor of Portuguese Language and it was reviewed later by an independent board of examiners (two other professors of Portuguese Language) to validate this linguistic adaptation.

5.3. Procedures

The first authoress of this study contacted university teachers to obtain their authorization and collaboration for the application of the instrument in their classes. Dates and timetables were then arranged for this purpose. The students responded to the inventory in their classroom context with their teacher present, when the questionnaire was applied, which took around 15 minutes. In each classroom the instrument was applied by two professional staff with a Master's Degree in Psychology or Education. Previous to the application of the test, the objective of the instrument was explained briefly to the students to be evaluated and they were guaranteed anonymity. The program IBM SPSS, version 22.0 was used to statistically analyze the results.

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6. Findings

Table 1 presents the results of the factorial analysis of the Inventory of Barriers to Personal Creativity items (Alencar, 1999) using the principal components method with a varimax rotation solution. For this analysis, after a first extraction of 13 factors with Eigen values greater than unity (which explains 61.3% of the variance in the items), attention was focussed on the extractions of the first four factors in accord with the theory inherent to the scale in its original version. The indexes of homogeneity and sphericity were adjusted for the factor analysis of the items (KMO=0.94; Bartlett $\chi 2 = 2 = 18435.28$; df=2145; p<.000).

The items of the scale can be divided into four factors, which explain 46% of the variance in the items. As can be noticed, there emerges a more general first factor, which explains the greater part of the total variance shown by the four factors (27%). However, the same factor has some items with lower commonality (h2). In other words, the variance explained by the four factors isolated - in a general way - indicates that the results are satisfactory enough, thus supporting the original version of the scale.

Passing on to the denomination of the factors it should be mentioned that Factor I brings together 14 items that can be designated as Inhibition/Shyness, Factor II covers 12 items related with Lack of Motivation, Factor III is associated with 10 items concerned with Lack of Time/Opportunities and Factor IV, which seems to express aspects of Social Repression, was made up of 8 items. These four factors correspond to those identified by the authors in the original version of the scale. However, there was not a total correspondence of the items of the factors in the two versions, since 22 items were eliminated for this study for two reasons: or not saturated above .30 in one factor (which was found linked in the original version of the scale) or because it was found equally saturated in more than one of the four factors identified.

Table 1. Factorial Analysis of Items in the Inventory of Barriers to Personal Creativity (n=582)

Items	I	II	III	IV	h2
21. I am not afraid to express what I think.	.767			.63	
2. I would be less timid in putting forward my ideas.	.719			.50	
5. I would not be so insecure.	.712			.55	
25. I would not be afraid of carrying out my ideas.	.704			.57	
20. I would not be afraid of facing up to criticism.	.688			.57	
36. I would not be afraid of what others will think about me.	.676			.58	
1. I would believe more in myself.	.637			.43	
3. I would be more spontaneous.	.602			.39	
28. I would not feel inferior to others.	.592			.50	

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16. I would not be afraid of confronting the unknown.	.583			.39	
10. I would not be afraid of contradicting people.	.564			.42	
26. I would be more extroverted.	.553			.37	
6. I would be prepared to take more risks.	.541			.39	
30. I would not be afraid of being misunderstood.	.533			.46	
65. I would be more enthusiastic.		.751		64	
63. I would be more concentrated on what I do.		.699		.52	
64. I would be more curious.		.691		.59	
59. I would have more energy.		.608		.43	
62. I would be rich in ideas.		.603		.48	
12. I would be less lazy.		.599		.46	
45. I would be more persistent.		.579		.45	
11. I would not be so accommodating.		.572		.49	
13. I would have more motivation to create.		.553		.40	
66. I would have more knowledge.		.553		.44	
58. I would be more dedicated in what I do.		.514		.28	
19. I would practice the habit of looking for new ideas more.		.477		.43	
34. I would have more opportunity of putting my ideas into practice.			.723	.59	
31. I would have more time to develop my ideas.			.687	.47	
37. I would have more opportunity to explore my potential.			.615	.54	
53. People would value my new ideas more.			.582	.46	
18. I would have greater recognition of my creative work.			.563	.35	
15. I would have more time.			.536	.29	
48. There would be more co-operation between people.			.521		.38
22. I would have been more stimulated by my professors.			.491		.31
46. My ideas would be valued more.			.482		.50
54. There would be more respect of the differences between people.			.433		.31
38. I would not have received such a strict education.				.708	.53
32. I would have not been limited by my family.				.639	.44
44. I would be less critical.				.618	.54
43. I would have had more opportunities to be wrong without being considered stupid or an idiot.				.591	.53
42. I would not have been limited by my professors.				.555	.42
55. I would be less authoritarian.				.530	.36
52. I would have had greater acceptance of the fantasy in the way that I live.				.484	.38
57. I would not been so critical about the ideas of others.				.415	.30
Eigen values	11.97	3.36	2.70	2.07	
% Variance	27.2	7.6	6.1	4.7	

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Grounded on the constituent items of each one of the sub-scales, the study proceeded to its internal validity using the alpha of Cronbach (reliability procedure in the IBM SPSS programme). The statistical values obtained are very close throughout the items and the four sub-scales. In terms of results from the sample, the averages of the items in Inhibition/Shyness and Lack of Motivation were 3.2 and 3.3, respectively. That for the Lack of Time/Opportunities sub-scale was 3.7 and for Social Repression it was 2.4. As desirable, the standard deviation of the items shows itself to be slightly above unity. On the other hand, the correlation coefficients between each item and the total of the sub-scale to which they belong are high (always above .30), thus obtaining good alphas of Cronbach, which were .91 for the Inhibition/Shyness sub-scale, .86 for the Lack of Motivation sub- scale, .83 for the Lack of Time/Opportunities sub-scale and .81 for the Social Repression sub-scale. These data are shown in Table 2.

Table 2. Means, Standard Deviations, Corrected Item Total x Correlations and Alfas of Cronbach, if item deleted. Co-efficients of Cronbach for each sub-scale and global scale (n=582)

	M	SD	cit	Alpha if…
Inhibition/Shyness (alpha =. 91)				
1. I would believe more in myself.	3.61	1.271	.561	.902
2. I would be less timid in putting forward my ideas.	3.61	1.316	.625	.900
3. I would be more spontaneous.	3.43	1.250	.539	.903
5. I would not be so insecure.	3.46	1.315	.636	.899
6. I would be prepared to take more risks.	3.71	1.156	.536	.903
10. I would not be afraid of contradicting people.	2.86	1.335	.554	.903
16. I would not be afraid of confronting the unknown.	3.11	1.280	.568	.902
20. I would not be afraid of facing up to criticism.	3.16	1.287	.685	.897
21. I am not afraid to express what I think.	3.18	1.289	.718	.896
26. I would be more extroverted.	2.92	1.312	.530	.903
28. I would not feel inferior to others.	2.56	1.359	.596	.901
25. I would not be afraid of carrying out my ideas.	3.28	1.212	.702	.897
30. I would not be afraid of being misunderstood.	2.95	1.230	.577	.901
36. I would not be afraid of what others will think about me.	2.89	1.333	.689	.897
Lack of motivation (alpha=. 86)				
11. I would not be so accommodating.	3.01	1.348	.532	.853
12. I would be less lazy.	3.04	1.464	.459	.858
13. I would have more motivation to create.	3.46	1.238	.536	.853
19. I would practice the habit of looking for new ideas more.	3.64	1.122	.511	.854
45. I would be more persistent.	3.48	1.174	.574	.851

58. I would be more dedicated in what I do.	3.28	2.179	.407	.873
59. I would have more energy.	3.30	1.319	.583	.849
62. I would be richer in ideas.	3.23	1.294	.572	.850
63. I would be more concentrated on what I do.	3.35	1.265	.634	.847
64. I would be more curious.	3.16	1.329	.653	.845
65. I would be more enthusiastic.	3.27	1.300	.719	.841
66. I would have more knowledge.	3.36	1.303	.548	.852
Lack of time/Opportunities (alpha=. 83)				
15. I would have more time.	3.87	1.242	.321	.833
18. I would have greater recognition of my creative work.	3.55	1.171	.491	.815
22. I would have been more stimulated by my professors.	3.45	1.222	.436	.821
31. I would have more time to develop my ideas.	3.70	1.172	.487	.815
34. I would have more opportunity of putting my ideas into practice.	3.48	1.153	.667	.797
37. I would have more opportunity to explore my potential.	3.55	1.094	.614	.803
46. My ideas would be valued more.	3.39	1.091	.583	.806
48. There would be more co-operation between people.	3.60	1.104	.526	.811
53. People would value my new ideas more.				
54. There would be more respect of the differences between people.	3.65	1.134	.603	.803
Social repression (alpha=. 81)				
32. I would have not been limited by my family	1.99	1.196	.541	.784
38. I would not have received such a strict education.	1.88	1.132	.597	.776
42. I would not have been limited by my professors.	2.36	1.215	.501	.790
43. I would have had more opportunities to be wrong without being considered stupid or an idiot.	2.83	1.383	.618	.771
44. Fosse menos criticado(a). I would be less critical.	2.47	1.191	.624	.772
52. I would have had greater acceptance of the fantasy in the way that I live. I would have had greater acceptance of the fantasy in the way that I live.	3.08	1.266	.447	.798
55. I would be less authoritarian.	2.07	1.069	.460	.795
57. I would not been so critical about the ideas of others.	2.47	1.136	.394	.804

Considering the four dimensions of the inventory, the study proceeded with an analysis of the eventual differences according to the course areas (Arts and Humanities, Social and Human Sciences and Science and Technology) and the gender of the students. For this purpose, an analysis of variance (F-ANOVA: 3 x 2) was carried out. Avoiding an unnecessary presentation of the averages and standard deviations of the results of the student sub-groups, it can be mentioned that no interaction effect was observed in the two variables

under analysis in relation to the results for the four dimensions of the scale. In terms of the main effects a difference can be observed in favour of the female students in perceptions about Inhibition (t=-3.14; gl=575; p=.002) and in favour of the male students in both Lack of Motivation (t=2.31; gl=575; p=.02) and Social Repression (t=2.56; gl=575; p=.01). Also a significant effect was observed concerning course area in the Social Repression dimension (F(2.571)=3.28; p=.04). In this case, a contrast analysis showed that the Arts and Humanities students had a more intense perception of the obstacles caused by Social Repression compared with their colleagues in Social and Human Sciences (t=2.35; gl=363; p=.019).

7. Conclusions

The study of creativity was focused more and more on the present day (Sawyer, 2006; Starko, 2010). In turn, higher education corresponds to a privileged educational level for responding creatively to present and future demands (Cropley & Cropley, 2009; Jackson, Oliver, Shaw, & Wisdom, 2006).

Nevertheless, creativity encounters barriers from the social and personal order in any context, particularly educational (Amabile, 1996; Cropley, 2009). Some obstacles to creative expression also have been observed in present day university teaching (Bewick et al., 2010; MacLaren, 2012). Meanwhile, few empirical studies have been developed in this respect, which suggests the need for new researches in order to identify elements that have facilitated or inhibited the capacity to be creative among university students.

In Brazil, the Inventory of Barriers to Personal Creativity (Alencar, 1999) was validated using university students and already there have been various studies with this population (Alencar, 2001; Alencar, Fleith, & Martínez, 2003; Joly & Guerra, 2004). It was considered relevant then to validate the aforementioned inventory for Portugal.

In the version validated here reference to the four factors of the original version was maintained; namely, Inhibition/Shyness, Lack of Motivation, Lack of Time/Opportunities and Social Repression. Two of them (Lack of Time/Opportunities and Social Repression) refer especially to elements of a social order that have an influence on creative expression (Amabile & Mueller, 2008). Nowadays the other two factors (Inhibition/Shyness and Lack of Motivation), which refer to emotional, motivational and personality variables, have been extensively discussed in the literature about creativity by authors like Amabile (1996, 1999) or Debreu, Baas, & Nijstad, 2012).

In the validation study described above some items, however, were eliminated from the original version, which left the inventory with a total of 44 items. Good psychometric characteristics were encountered in this research. All the factors showed high coefficients of

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internal consistency of the items (alfa values of Cronbach being between .81 and .91) and the variance of the results was explained in 46% by the factorial structure studied.

It is to be stressed that in this Portuguese study, as much in the Brazilian one (Alencar, 1999; 2010), the factor with the highest average was Lack of Time/Opportunities. It is clear that various authors, like Jackson (2006) and Cachia, Ferrari, Ala-Mutka and Punie (2010), point out that lack of time and a strong emphasis on the acquisition of knowledge thus limit the opportunities for students to think, imagine, create and deviate from what is prescribed, thereby reducing the possibilities for their creative expression. In a globalised and technological world like that of the 21st Century, which is characterised by the speed and quantity of information, communication in real time, cultural interchanges and richness of opportunities and experiences, the human being is confronted daily more and more with an infinity of action options. The time available is not always sufficient. We can say that lack of time is the main problem of this century, whichever part of the world the civilized individual inhabits.

On the other hand, the factor with the lowest average was Social Repression. Probably, such a result is due to the nature of the items related to this factor, which concern the less frequent practices in present days, as is exemplified by the following: "I would be more creative if ... I had not been limited by the family", "…I had not been limited by my teachers" or "… I had not received a strict education". It is emphasised that in previous studies, which analysed the "gender" variable, a higher average in this factor was obtained, as much by female university students as by female teachers (Alencar, 2001; Alencar & Fleith, 2003), which reflects a different pattern of socialisation for men and women in society.

Future research involving the perception of students from other countries about personal barriers to creativity will provide clues with respect to the influence of the cultural and social environment on the creative process. Traditions, values and beliefs shared and transmitted from generation to generation, besides social factors like instability, political regime, wars and economic crises, can have an impact on creative production and on individual perceptions about the future (Simonton, 1994). Creativity cannot be understood, when isolated from its social context, as affirmed by this same author (Simonton, 1988). On the other hand, he argues that creativity is a special form of personal influence. At the same time that political, social and cultural factors affect creative production, the person that creates also causes changes in the way a society thinks and expresses itself. That is to say, the elements that stimulate and inhibit creativity are associated both with internal and external aspects of the individual.

In conclusion, the study to validate the Inventory of Barriers to Personal Creativity amongst Portuguese university students shows favourable results, as a consequence of its use in research. More specifically, it will be one more contribution for understanding about what impedes or makes difficult the development and the expression of the creative potential of this population: a potential that is so urgently required for the immediate future (Csikszentmihalyi, 2006; Péter-Szarka, 2012). A major investment in research about creativity in Higher Education is necessary (Balchim, 2005; Kleiman, 2008). Since almost nothing exists in Portugal about the topic, it is hoped that this evaluation instrument will stimulate diverse researches, whether about the inventory studied (with larger and more varied samples, for example, since this study included participants from only one educational institution) or whether cross-referenced to the results obtained with other variables. Comparative studies involving Portuguese and Brazilian samples should also be carried out. The identification of the barriers to the expression of creativity above all among students in higher education also has various practical implications. This is especially true because the future professional has to make fuller use of his/her potential concerning the current challenges of the work market and society in general. So, in university student counselling and guidance services, as in the training of teachers at this level of education, this instrument can and must be used. The identification of these barriers in these functions can be the first step for organising intervention strategies (individual and/or in groups, with students and/or professors). These strategies, which allow for the extension of opportunities for creative expression, thus make possible the overcoming of the obstructive elements.

To become aware of where creativity lives on Campus will give clues for promoting it in this same context (Pachucki et al., 2010). To understand also why creativity does not lives (or does not lives as much as would be desirable) in a university will be essential for the same goal of intervention. Therefore, the availability of this inventory for the Portuguese population is a tool that will make such a situation possible.

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References

Adams, K. (2006). *The sources of innovation and creativity*. Washington, DC: The National Center on Education and the Economy.

Alencar, E. M. L. S. (1999). Barreiras à criatividade pessoal: Desenvolvimento de um instrumento de medida. *Psicologia Escolar e Educacional, 3*, 123-132. https://doi.org/10.1590/S1413-85571999000200002

Alencar, E. M. L. S. (2001). Obstacles to personal creativity among university students. *Gifted Educational International, 15*, 133-140. https://doi.org/10.1177/026142940101500203

Alencar, E. M. L. S. (2010). Inventário de Barreiras à Criatividade Pessoal. In E. M. L. S. Alencar, M. F. Bruno-Faria & D. S. Fleith (Eds.), Medidas de criatividade: Teoria e prática (pp. 35-54). Porto Alegre: Artmed.

Alencar, E. M. L. S., & Fleith, D. S. (2003). Barreiras à criatividade pessoal entre professores de distintos níveis de ensino. *Psicologia: Reflexão e Crítica, 16*, 63-69. https://doi.org/10.1590/S0102-79722003000100007

Alencar, E. M. L. S., Fleith, D. S., & Martínez, A. M. (2003). Obstacles to creativity among Brazilian and Mexican university students: A comparative study. *The Journal of Creative Behavior, 37*, 179-192. https://doi.org/10.1002/j.2162-6057.2003.tb00832.x

Amabile, T. M. (1991). *Growing up creative*. Buffalo, NY: The Creative Education Foundation. https://doi.org/10.1080/10400418909534321

Amabile, T. M. (1996). *Creativity in context*. Boulder, CO: Westview Press.

Amabile, T. A. (1999). *Como não matar a criatividade*. HSM Management, 12, 110-116.

Amabile, T. A., & Gryskiewicz, N. D. (1989). The Creative Environment Scales: Work Environment Inventory. *Creativity Research Journal, 2*, 231-253.

Amabile, T. A, & Mueller, J. S. (2008). Studying creativity, its processes, and its antecedents. In J. Zhou, & C. E. Shalley (Eds.), *Handbook of organizational creativity* (pp. 33-64). New York: Lawrence Erlbaum.

Balchim, T. (2005). Assessing students' creativity: The importance of creativity styles. Available in http://heacademy.ac.uk/creativity.htm.

Beghetto, R. A. (2010). Creativity in the classroom. In J. C. Kaufman & R. J. Sternberg (Orgs.), *The Cambridge handbook of creativity* (pp. 447-463). Cambridge: Cambridge University Press. https://doi.org/10.1017/CBO9780511763205.027

Bewick, B., Koiutsopoulou, G, Miles, J., Slaa, E., & Barkham, M. (2010). Changes in understanding students` psychological well-being as they progress through university. *Studies in Higher Education, 35*, 633- 645. https://doi.org/10.1080/03075070903216643

Cachia, R., Ferrari, A., Ala-Mutka, K., & Punie, Y. (2010). *Creative learning and innovative teaching. Final report on the study on creativity and innovation in education in the EU member states*. Luxembourg: Publication Office of the European Union.

Craft, A. (2005). Creativity in schools: Tensions and dilemmas. UK: Routledge.

Cropley, A. (2006). Creativity: A social approach. *Roeper Review, 28*, 125-130. https://doi.org/10.1080/02783190609554351

Cropley, A. (2009). *Creativity in education and learning: A guide for teachers and educators*. New York: Routledge Falmer.

Cropley, A., & Cropley, D. (2009). *Fostering creativity: A diagnostic approach for Higher Education and Organizations*. Cresskill, NJ: Hampton Press.

Csikszentmihalyi, J. A. (2006). Foreword: developing creativity. In N. Jackson, M. Oliver, M. Shaw & J. Wisdom (Eds.), *Developing creativity in higher education* (pp. xvii-xx). New York: Routledge.

Debreu, C. K. W., Baas, M., & Nijstad, B. A. (2012). The emotive roots of creativity: Basic and applied issues on affect and motivation. In M. Mumford (Ed.), *Handbook of organizational creativity* (pp. 217-240). San Diego: Academic Press. https://doi.org/10.1016/B978-0-12-374714-3.00010-0

Dewett, T., & Gruys, M. L. (2007). Advancing the case for creativity through graduate business education. *Thinking Skills and Creativity, 2*, 85-95. https://doi.org/10.1016/j.tsc.2007.04.001

Florida, R. (2003). *The rise of the creative class: And how it's transforming work, leisure, community and everyday life*. Annandale, Australia: Pluto Press.

Fryer, M. (2006). Faciliting creativity in higher education: A brief account of National Teaching Fellows'views. In N. Jackson, M. Oliver, M. Shaw, & J. Wisdom (Orgs.), *Developing creativity in higher education* (pp. 74-88) New York: Routledge.

Furedi, A. (2006). *Culture of fear revisited*. London: Continuum.

Hargreaves, J. (2008). Risk: The ethics of a creative curriculum. *Innovations in Education and Teaching International, 45*, 227- 234. https://doi.org/10.1080/14703290802176006

Jackson, N. (2006). Creativity in higher education. Creating tipping points for cultural change. *SCEPTrE Scholarly Paper, 3*, 1-25.

Jackson, N., Oliver, M. Shaw, M., & Wisdom, J. (2006). (Eds.). *Developing creativity in higher education*. New York: Routledge. https://doi.org/10.4324/9780203016503

Joly, M. C. R., & Guerra, P. B. C. (2004). Compreensão em leitura e barreiras à criatividade: Um estudo com universitários ingressantes. *Psico, 35*, 151-159.

Jones, L. (1993). Barriers to creativity and their relationship to individual, group, and organizational behavior. In S. G. Isaksen, M. C. Murdock, R. L. Firestien, & D. J. Treffinger (Eds.), *Nurturing and developing creativity: The emergence of a discipline* (pp. 133 – 154). Norwood, NJ: Ablex.

Kleiman, P. (2008). Towards transformation: Conceptions of creativity in higher education. *Innovations in Education and Teaching International, 45*, 209-217. https://doi.org/10.1080/14703290802175966

Kwasniewska, J., & Necka, E. (2004). Perception of the climate for creativity in the workplace: The role of the level in the organization and gender. *Creativity and Innovation Management, 13*, 187-196. https://doi.org/10.1111/j.0963-1690.2004.00308.x

Lubart, T., & Zenasni, F. (2010). A new look at creative giftedness. *Gifted and Talented International, 25*, 53-57. https://doi.org/10.1080/15332276.2010.11673549

Lucas, R. E. (2007). Long-term disability is associated with lasting changes in subjective well-being: Evidence from two nationally representative longitudinal studies. *Journal of Personality and Social Psychology, 92*(4), 717-730. https://doi.org/10.1037/0022-3514.92.4.717

MacLaren, I. (2012). The contradictions of policy and practice: Creativity in higher education. *London Review of Education, 10*, 159-172. https://doi.org/10.1080/14748460.2012.691281

McWilliam, E. (2008). Unlearning how to teach. *Innovations in Education and Teaching International, 45*, 263- 269. https://doi.org/10.1080/14703290802176147

McWilliam, E., Hearn, G., & Haseman, B. (2008). Transdisciplinarity for creative futures: What barriers and opportunities? *Innovations in Education and Teaching International, 45*, 247-253. https://doi.org/10.1080/14703290802176097

Necka, E. (1992). *Creativity training.* Cracov, Poland: Universitas.

Northedge, A. (2003). Enabling participations in academic discourse. *Teaching in Higher Education, 8*, 169-180. https://doi.org/10.1080/1356251032000052429

Pachucki, J, Lena, J. C., & Tepper, S. (2010). Creativity narratives among college students: Sociability and everyday creativity. *The Sociological Quarterly, 51*, 122-149. https://doi.org/10.1111/j.1533-8525.2009.01161.x

Péter-Szarka, S. (2012). Creative climate as a means to promote creativity in the classroom. *Electronic Journal of Research in Educational Psychology, 10*, 1011-1034. https://doi.org/10.25115/ejrep.v10i28.1547

Runco, M. A. (2007). *Creativity: theories and themes, research, development and practice*. London: Elsevier Academic Press.

Reis, S. M. (2003). Toward a theory of creativity in diverse creative women. *Creativity Research Journal, 14*(3-4), 305-316. https://doi.org/10.1207/S15326934CRJ1434_2

Sawyer, R. K. (2006). *Explaining creativity: The science of human innovation*. New York: Oxford University Press.

Simonton, D. K. (1988). Creativity, leadership, and chance. In R. J. Sternberg (Ed.), *The nature of creativity* (pp. 386-426). New York: Cambridge University Press.

Simonton, D. K. (1994). *Greatness. Who makes history and why*. New York: The Guilford Press. Smith-Bingham, R. (2006). Public policy, innovation and the need for creativity. In N. Jackson, M. Oliver, M. Shaw, & J. Wisdom (Orgs.), *Developing creativity in higher education* (pp. 10-18) New York: Routledge.

Starko, A. J. (2010). *Creativity in the classroom: Schools of curious delight*. New York: Routledge. https://doi.org/10.4324/9780203871492

Sternberg, R. (2004). Teaching college students that creativity is a decision. *Guidance & Counseling, 19*, 196-200.

Sternberg, R. J., & Lubart, T. I. (1995). Defying the crowd. Cultivating creativity in a culture of conformity. New York, NY: The Free Press.

Wilcoxson, L., Cotter, J., & Joy, S. (2011). Beyond the first year of experience. The impact on attrition of students' experiences throughout undergraduate degree studies in six diverse universities. *Studies in Higher Education, 36*, 331-352. https://doi.org/10.1080/03075070903581533