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Career intervention effectiveness and motivation: blended and distance modalities comparison

Eficácia e motivação numa intervenção de carreira: comparação entre as modalidades blended e a distância

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Abstract

This study evaluates the effectiveness of an intervention program on career resources in the blended and distance modalities and explores the relationship between changes in career resources and self-determined motivation. For this purpose, two groups of 68 and 72 higher education students participated in blended and distance career interventions, respectively. The blended program took place in a curricular infusion context, and was subject to assessment, while the distance program was fully voluntary. Students were assessed with pre- and post-tests regarding four career resources' dimensions. Motivation over program experience was assessed after the intervention. The results indicate that despite some differences between the two modalities, both career interventions were effective, with gains in three of the four assessed career resources' dimensions. Relatedness was higher in the blended format of the program, while participants in the distance format reported experiencing higher levels of autonomy during the program. Despite that, motivation variables did not present a relevant predictive power in career resources' gains obtained through participation in the program. Implications for practice include the possibility of infusing the program into curricula of higher education degrees as a way of increasing program completion and reaching different audiences and highlighting the importance of using multiple approaches to broaden its reach.

Keywords: career resources; blended learning; online courses; motivation; higher education.

Resumo

O presente estudo avalia a eficácia de um programa de intervenção nos recursos de carreira nas modalidades *blended* e a distância, e explora a relação entre as mudanças nos recursos de carreira e a motivação autodeterminada. Para tal, dois grupos de 68 e 72 estudantes do Ensino superior participaram em intervenções *blended* e a distância, respetivamente. O programa *blended* teve lugar num contexto de infusão curricular e foi sujeito a avaliação, enquanto o programa a distância foi totalmente voluntário. Os estudantes foram avaliados em dois momentos, pré- e pós-teste, em relação a quatro dimensões de recursos de carreira. A motivação da experiência no programa foi avaliada após a intervenção. Os resultados indicam que, apesar de algumas diferenças entre as duas modalidades, ambas as intervenções de carreira foram eficazes, com ganhos em três das quatro dimensões de recursos de carreira. A perceção de conexão foi mais elevada na versão *blended* do programa, enquanto os participantes no formato a distância reportaram níveis mais elevados de autonomia durante o programa. Apesar disso, as variáveis motivacionais não apresentaram um poder preditivo relevante em relação aos ganhos nos recursos de carreira obtidos pela participação no programa. Em termos de implicações para a prática, os resultados sugerem a possibilidade de integrar intervenções nos currículos dos cursos superiores como forma de aumentar a permanência e de atingir diferentes públicos, sublinhando-se a importância de utilizar múltiplas abordagens para alargar o seu alcance.

Palavras-chave: recursos de carreira; cursos *blended*; cursos *online*; motivação; ensino superior.

Online learning and online career interventions

Online learning, defined as education using the internet in an online environment for teaching and learning (Singh & Thurman, 2019), has become an unavoidable discussion in Higher Education (HE) over the past two decades (Garrison & Kanuka, 2004). In 2023, 30% of EU internet users reported doing an online course or using online learning material in the previous three months (Eurostat, 2024).

With the rise in popularity of online education, concerns about its quality have increased among academics and practitioners (Wang, 2024). One of the biggest challenges of online education concerns students' persistence, with dropout rates in online learning environments ranging between 30 and 50% (Ribeirinha et. al., 2024; Shi & Zhou, 2023), some studies even pointing to non-completion rates as high as 75 to 90% (Hsu et al., 2019). These high percentages have raised attention to issues related to the effectiveness of online interventions, including the role of motivational factors in the success of these actions regarding their completion and achievement. For this reason, it is important to know more about the influence of motivation on the process and results of online engagement in educational activities, and its relationship with different modalities of intervention (Halverson et al., 2014; Hernández-Arvizu et al., 2023; Vaughan, 2014; Zavyalova, 2020).

Online education allows for full distance learning enabling students to engage without restrictions of time, place, or situation while still being involved in a learning community, therefore being simultaneously connected and apart (Garrison & Kanuka, 2004). Blended learning, understood as "the thoughtful integration of classroom face-to-face learning experiences with online learning experiences" (Garrison & Kanuka, 2004, p. 96), is one of the primary and rapidly growing ways of introducing online learning in HE, to the point of being considered by some as the new normal (Zavyalova, 2020). Blended learning differs from other forms of online education, as it occupies the middle position in a continuum of online integration ranging from enhanced learning to fully online learning. Although there is no quantifiable distinction between these types of education, the test of real blended education lies in the effective integration of both modalities, where they are not merely juxtaposed, but rather there is a reorganisation of the teaching and learning dynamics (Garrison & Kanuka, 2004).

Blended learning aims to associate the benefits of online learning and face-to-face education and has been used to respond to various problems posed by face-to-face education, such as international and multi-institutional collaboration, bridging geographical distances, or the specific needs of different groups of students (Gerbic, 2011; Hong Minh et al., 2023). Most relevantly for the present study, it has also been reported to contribute

to students' motivation (Chakawodza et al., 2024; Nass et al., 2023), avoiding one of the potential drawbacks of online education.

Focusing specifically on career interventions for HE students, programs delivered remotely in online environments have gained significant attention (e.g., Carvalho et al., 2023; Pordelan et al., 2018) due to the growing need for more flexible and accessible opportunities (Pordelan et al., 2018; Sampson et al., 2020). The recent pandemic has also shed light on the specific needs of HE students in that context (Hernández-Arvizu et al., 2023; Pereira et al., 2022). Even though additional evidence illustrating how distance career interventions may enhance HE students' career-related skills is needed (Hirschi et al., 2018; Kettunen & Sampson, 2019; Soares et al., 2022), a few studies have evidenced their positive effect, for instance, on career adaptability (Carvalho et al., 2023; van der Horst et al., 2021), career planning and exploration (Pordelan et al., 2018; Pordelan & Hosseinian, 2021), and career resources.

Blended career intervention emerges as a promising intervention modality. However, the blended learning approach in the context of career interventions and how it impacts students' outcomes has been scarcely studied. While substantial research has evidenced that outcomes in online and blended environments can overcome those obtained in face-to-face contexts (Chakawodza et al., 2024; Drouin et al., 2015; Hong Minh et al., 2023; Min & Yu, 2023), the efficacy of distance career interventions (Kettunen & Sampson, 2019) and, particularly, specificities inherent to distance and blended interventions (Lau et al., 2021), need further investigation. Such information is fundamental for academics, practitioners and policymakers to assess which programs need to be fostered to promote career development among HE students.

As HE institutions increasingly recognise their role in promoting the career development of HE students, the ways of integrating career education into education and training programs also emerge as a concern. Career education tends to be integrated into curricula in one of four ways: i) as a separate subject; ii) as a mandatory theme across the curriculum, sometimes referred to as curricular infusion; iii) as part of extracurricular activities; or iv) a mix of two or all the above (Sultana, 2012). In this study we will focus on the inclusion of content and activities aiming to promote career development as part of an elective curriculum subject. This poses challenges related to curriculum overload but facilitates a clear focus on career development and having a specialised teacher or mentor in charge of that subject. In an evaluation-oriented system, having an assessment and evaluation associated with the subject may also motivate students (Sultana, 2012). This notion is reinforced by the work of Vaughan (2014), who stresses the pivotal role of evaluation as a learning driver in HE, specifically in blended courses. Being subjected to evaluation may, therefore, have motivational impacts, further mitigating the tendency

for dropout observed in distance education. In this context, a question that lacks more empirical research is to what extent a career intervention that is integrated into the curriculum as mandatory and that has tangible benefits (grades) may be as effective as a career intervention that depends on participants' voluntary enrolment, considering career outcomes and completion.

Motivation and online career interventions

Online learning can present motivational challenges due to perceived isolation, misconceptions about the learning process, and technological difficulties, all of which can hinder engagement and academic success (Min & Yu, 2023; Zavyalova, 2020). Learners' motivation in online programs, therefore, seems to require further study as it is sometimes presented as increased by blended learning strategies (Vaughan, 2014) and other times as posing difficulties in those settings (Zavyalova, 2020). In this context, Self-Determination Theory (SDT) represents one of the most cited theories, applied in various domains and settings (Chen & Jang, 2010; Deci & Ryan, 2000). Self-determination refers to one's ability to make choices and manage one's life path, impacting motivation. According to the SDT, when people perceive that their actions may contribute to an outcome, they are more likely to feel intrinsically motivated and engaged to act. People are motivated to grow and change when their basic psychological needs for competence, relatedness, and autonomy are supported. Several studies have supported the validity of the SDT in traditional learning settings, evidencing that an autonomy-supportive learning environment, favouring individuals' basic psychological needs, promotes positive learning outcomes (Reeve, 2002).

However, in online learning environments, research about SDT is still incipient, and there is still insufficiently consolidated knowledge about the relevance of motivation, particularly of the perception of autonomy, competence, and relatedness, to learning outcomes. A study conducted by Rowland (2016) analysed the association between the SDT components, measured by the Basic Psychological Needs Scale (Deci & Ryan, 2000; Gagné, 2003), in the context of an online teaching certification program not related to career education. Significant correlations were found between competence and self-perceived overall learning after the program. The SDT components have also been explored in relation to student engagement, although the overall results suggest that the relationships seem to vary across different contexts and education levels (Shah et al., 2021). Considering online experience during the COVID-19 pandemic, research suggests positive and significant relationships between the SDT variables and students' engagement in online learning (Chiu, 2022; Shah et al., 2021). The relation between the SDT and learning outcomes has also been explored, although with contradictory results. Chen and Jang (2010) did not find an

association between self-determined motivation and learning outcomes in online courses, while findings from Hsu et al. (2019) indicated that the satisfaction of basic psychological needs contributes to increased achievement in online learning.

The present study

A previously developed online distance career intervention program offered as an extracurricular activity was adapted to be offered as part of an elective curriculum subject, in a blended learning environment. The original program attracted only some of the HE institution students (mostly students in the final years of their academic degrees) and faced some difficulties retaining participants until the end of the intervention. The subject included weekly face-to-face classes and online, asynchronous activities. While the subject was elective, the intervention program was included as a mandatory activity required for its successful completion.

This program adaptation was intended to reach a different public, as it is verified that students volunteering for extracurricular programs often lead to a selection bias. On the other hand, the adaptation to a blended program and integration into the curriculum, including an element of evaluation, was devised to help overcome participant dropout and non-completion of activities. Taking that context, the following objectives of the present research were designed: a) to evaluate the effect of an intervention program on career resources in blended and distance modalities –including consideration of the extent to which a program that is not of voluntary attendance can be effective in promoting participants' career resources; b) to explore the relationship between the changes on career resources and motivational variables.

This study is expected to contribute to developing knowledge regarding the effectiveness of online career interventions, comparing an online distance extracurricular environment with a blended environment integrated into the curriculum. To our knowledge, and despite the growing number of online career interventions, there are still no studies focusing on this issue. This study is also expected to add knowledge about the relationship between motivational variables, particularly the SDT components, and career intervention outcomes.

Method

Participants

Two groups of HE (Higher Education) students from a public university in northern Portugal participated in this study. One group of participants included 68 students between 18 and 25 years old (M = 20.12; SD = 1.37) who participated in a career intervention program

adapted to the blended learning modality and integrated into the curriculum of their HE degrees (Blended intervention group - BIG). These 68 participants were all those who not only registered for this subject and completed the program but also agreed to participate in the study and took both the pre- and post-test assessments. Considering 109 students in total had registered for the subject, that means that 73.9% of the participants in the program were ultimately included in the BIG. Most of the BIG students were female (*n* = 43) and were in the first three academic years (*n* = 65). The second group integrated 72 students aged between 18 and 44 years old (*M* = 22.37; *SD* = 5.19) who concluded the program in the distance extracurricular modality (Distance intervention group - DIG). Two hundred and eleven students voluntarily registered to participate in this modality, 122 (57.8%) of whom completed the program and pre- and post-test assessments. A sample of 72 DIG participants was randomly selected from the larger sample to reduce potential bias in statistical analysis due to unequal sample sizes of groups. Most DIG students were female (*n* = 52), following the trend of the institutions represented, and were in the third, fourth, and fifth academic years (*n* = 56).

Instruments

Sociodemographic questionnaire

This questionnaire gathered data on students' age, sex, and academic years and was filled in during the pre-test moment.

Career Resources Questionnaire (CRQ; Monteiro & Almeida, 2021a)

This questionnaire, adapted for Portuguese HE students, from the original version of Hirschi et al. (2018), assesses 12 career resources through 38 items answered on a Likert scale from 1 (not true at all) to 5 (completely true). The career resources are integrated into four higher-order dimensions, as in the original instrument: knowledge and skills (e.g.: *I have a very high level of expertise and skill for my desired occupation*); environment (e.g.: *I feel fully supported in my career development by my current university*); motivation (e.g.: *When I set goals for my career, I am confident that I can achieve them*), and; career management resources (e.g.: *I regularly collect information about career opportunities*). Alpha values obtained for each dimension were the following: knowledge and skills: α = .89 at the pre-test and .88 at the post-test; environment: α = .89 at the pre-test and .89 at the post-test; motivation: α= .88 at the pre-test and .88 at the post-test; career management resources: α = .92 at the pre-test and .92 at the post-test.

Intrinsic Motivation Inventory (IMI; Ryan, 1982; Ryan et al., 1983)

The IMI assesses participants' subjective experiences of an activity or task and was filled in at the end of the program. Only the subscales evaluating interest/enjoyment (e.g.:

I would describe this programme as very interesting) and value/usefulness (e.g.: *I think this programme is useful for reflecting on my professional future*) were used in this study. Each subscale is composed of seven items answered on a 7-point Likert scale where 1 stands for "not at all true", 4 for "somewhat true", and 7 for "very true". Cronbach's alpha values for the interest/enjoyment and the value/usefulness were, respectively, .95 and .94.

Basic Psychological Need Scale (BPNS; Rowland, 2016)

This scale assesses the perceived fulfilment of basic psychological needs. A version adapted to assess needs satisfaction in the context of a program intervention was used. Three subscales were used concerning autonomy (e.g.: *I felt I had some choice about how to develop the skills I needed in the program*), competency (e.g.: *I felt I had some choice about how to develop the skills I needed in the program*), and relatedness (e.g.: *The people in the program cared about me*) at the end of the intervention. Answers were provided on a 7-point Likert scale from 1 (not at all true) to 7 (very true), where 4 equals "somewhat true". The autonomy subscale included 7 items, but exploratory data analysis suggested the need to exclude one of them (item 4), given its discrepancy in terms of consistency with the other items. Cronbach's alpha for this subscale reached .68. The competence subscale included six items, and the relatedness one included eight items, with Cronbach's alphas of .71 and .78, respectively.

Intervention program

The intervention program was based on the Career Resources Model (Hirschi, 2012; Hirschi et al., 2018) and on the student workbook for in-depth knowledge of the Career Resources Questionnaire (Hirschi, 2017). The five critical ingredients to foster career interventions' efficacy (Brown et al., 2003) and additional theoretical frameworks also guided the design and adaptation of the activities and resources to integrate into the program to be implemented in both the distance and blended modalities, such as Bloom's revised educational objectives taxonomy (Anderson et al., 2001; Krathwohl, 2002) and Self-Determination Theory (Deci & Ryan, 2000; Ryan & Deci, 2017). The main differences in the activities' implementation according to the modality can be seen in Table 1.

Table 1

Program implementation features in the Blended Intervention Group (BIG) and the Distance Intervention Group (DIG)

Modules	Activities	BIG	DIG
0	Presentation of the program, the teacher/moderator, and students	Face-to-face During class Teacher support	Remotely Synchronous session via the Colibri-Zoom V3 plataform (https://videoconf-colibri.zoom.us/)
	Navigating the Moodle platform		
1 to 4	Introduction to the resources focused in each module through a video	Face-to-face During class Group reflection Teacher support	Remotely Asynchronous Individual reflection
	Collective activity	Face-to-face During class Group reflection Teacher support	Remotely Asynchronous Group reflection on a Forum
	Individual activities	Remotely Asynchronous Individual reflection	Remotely Asynchronous Individual reflection
5	Completion of the portfolio and program summary	Face-to-face During class Teacher support	Remotely Synchronous session via the Colibri-Zoom V3 plataform (https://videoconf-colibri.zoom.us/)

Design and procedures

An intervention study was conducted, with pre-test (before intervention = Time 1), and post-test (after intervention = Time 2) assessments of two groups: the DIG and the BIG. Students in the DIG signed up voluntarily to participate in the program and research. In contrast, students in the BIG automatically enrolled in the program since it was implemented as part of an elective subject, open to students from diverse study fields and academic years. Participation in the study, however, was voluntary.

Before the intervention, students from both groups answered the sociodemographic questionnaire and the CRQ. After the intervention, they filled in the CRQ again and answered the IMI and the BPNS. All data was collected online via Google Forms.

The Ethical Committee from the institution where the program was developed approved the research (approval CEISCH 076-2021), and all participating students voluntarily collaborated and provided informed consent.

Data analysis

Descriptive statistics were calculated to characterize both intervention groups (BIG and DIG) regarding sociodemographic variables (sex, age, academic year) and their scores in each career resources' dimension and each SDT motivation variable. The difference between means from time 1 (pre-test) and time 2 (post-test) for both BIG and DIG in each dimension of the career resources were computed. To evaluate changes in career resources

from time 1 (pre-test) to time 2 (post-test) within each intervention group, paired sample T-tests were conducted for each dimension of career resources. Cohen's *d* was used as a measure of effect size, considering $d < .2$ very small effect; $d = .2 - .49$ small effect; $d = .50 - .79$ medium effect; and $d > 0.80$ large effect (Cohen, 1988). Independent samples T-tests were used to compare the career resource gains between the BIG and the DIG and evaluate whether significant differences existed between the two intervention modalities in terms of career resources' growth. Cohen's *d* was, again, used as a measure of the effect size. Independent samples T-tests were also employed to analyze the differences between the BIG and DIG regarding the SDT motivational variables and the effect size was measured with Cohen's *d* coefficient. To explore relationships between career resource gains and motivational variables within each group, Pearson correlation coefficients were calculated and linear regression analyses were conducted to examine the predictive power of motivational variables on the gains in career resources dimensions for both groups. All statistical analyses were conducted using a significance level of $p \leq .05$.

Results

Comparison of the blended and distance modalities regarding career resources' changes

Table 2 presents descriptive statistics of the four dimensions of career resources before and after the intervention program and the difference between means from time 1 (pre-test) and time 2 (post-test) for both BIG and DIG. Regarding the BIG, the overall results show an increase in all the dimensions of career resources between the pre and post-test. Career management shows the most improvement, followed by knowledge and skills, environment, and motivation. Paired sample *t*-test evidenced significant differences between time 1 and time 2 for knowledge and skills, environment, and career management. No significant differences emerged between the two times for the dimension of motivation. Concerning the DIG, the results evidenced significant differences between time 1 and time 2 for the dimensions knowledge and skills, motivation, and career management. No significant differences were found for the dimension environment.

Paired sample *t*-tests were conducted to compare the changes obtained in career resources between time 1 and time 2, in both groups. Significant differences were found in the dimension of knowledge and skills ($t(138) = 1.628$, $p = .05$, Cohen's $d = .27$), favouring the participants of the distance modality of the program. No other significant differences were obtained for the other dimensions: environment ($t(138) = -.493$, $p = .31$, Cohen's $d = -.08$); motivation ($t(138) = 1.474$, $p = .07$, Cohen's $d = .25$); career management ($t(138) = 1.073$, $p = .14$, Cohen's $d = .18$).

Table 2

Descriptive statistics and statistical differences at Time 1 (pre-test) and Time 2 (post-test) for the Blended Intervention Group (BIG, n = 68) and the Distance Intervention Group (DIG, n = 72)

Group	Career resources dimensions	Time 1		Time 2		Difference between means	*t*	*p*	Cohen's *d*
		M	*SD*	*M*	*SD*				
BIG (*df* = 67)	Knowledge and skills	3.09	.51	3.29	.55	.21	-3.414	.001	-.41
	Environment	3.36	.68	3.51	.68	.16	-1.943	.056	-.24
	Motivation	3.31	.67	3.39	.66	.08	-1.220	.227	-.15
	Career management	3.08	.71	3.32	.74	.24	-2.885	.005	-.35
DIG (*df* = 71)	Knowledge and skills	3.01	.65	3.37	.59	.36	-5.141	< .01	-.61
	Environment	3.47	.65	3.57	.55	.10	-1.461	.148	-.17
	Motivation	3.23	.69	3.45	.50	.22	-2.903	.005	.34
	Career management	3.05	.73	3.41	.58	.36	-5.003	< .01	-.59

Comparison of the blended and distance modalities regarding motivational variables

Table 3 presents the descriptive statistics of the motivational variables assessed at the end of the career intervention program. Comparing the two modalities of the program, significant differences were found for the dimensions of relatedness, favouring the BIG, and autonomy, with higher scores for the DIG.

Table 3

Descriptive statistics and statistical differences between motivational variables for the Blended Intervention Group (BIG) and the Distance Intervention Group (DIG)

Motivation variables	BIG (*n* = 68)		DIG (*n* = 72)		*t*(138)	*p*	Cohen's *d*
	M	*SD*	*M*	*SD*			
IMI-Value/usefulness	5.58	1.09	5.81	1.02	1.298	.197	.22
IMI - Interest/ enjoyment	5.57	1.15	5.59	1.24	0.118	.906	.20
BPNS - Autonomy	5.33	.79	5.63	.83	2.204	.029	.37
BPNS - Competence	5.26	.88	5.35	.84	0.602	.548	.10
BPNS - Relatedness	5.08	.94	4.69	.86	-2.569	.011	-.43

Relation between changes in career resources and motivational variables

Table 4 presents the correlations between changes in career resources and motivational variables for the BIG and the DIG. In relation to the BIG, a significant and positive association exists between changes in career resources and motivational variables, even though not evident between all of them. Changes in motivational career resources are

not associated with any motivational variable; on the other hand, changes in environmental career resources are associated with all motivational variables. In addition, changes in career management are only correlated with BPNS-Competence and changes in knowledge and skills are significantly associated with three of the five motivational variables. Concerning the DIG, Table 4 shows weak to moderate correlations between changes in knowledge and skills and four motivational variables (with the exception of the variable competence). No other statistically significant correlations were found between changes in career resources and motivational variables.

Table 4

Correlations between changes in career resources and motivational variables for the Blended Intervention Group (BIG) and the Distance Intervention Group (DIG)

Group	Changes in career resources	Motivational variables				
		IMI		BPNS		
		Value/Usefulness	Interest/Enjoyment	Autonomy	Competence	Relatedness
BIG	Knowledge and skills	.27*	.25*	.10	.26*	.10
	Environment	.34**	.37**	.30*	.47***	.32**
	Motivation	-.02	.04	.04	.20	-.01
	Career management	.17	.23	.13	.32**	.08
DIG	Knowledge and skills	.25*	.24*	.29*	.23	.35**
	Environment	.07	-.03	.07	-.02	.02
	Motivation	.15	-.03	.08	-.02	.02
	Career management	.06	-.01	.07	.04	-.05

*p< .05, **p< .01, ***p< .001

Table 5 shows the results of the linear regressions conducted to explore whether the motivational variables have explanatory value for the gains obtained in career resources in both intervention groups. The results show that competence is the only variable with statistically significant coefficients for the dimensions of environment, motivation, and career management of the BIG. As for the DIG, value/usefulness has a significant coefficient for the dimension of motivation. Moreover, it is in the environment dimension that the set of motivational variables shows more relevant value in terms of the adjusted . square, reaching, in this case, a total of 17% of the variance explained in the BIG.

Table 5

Standardized beta and adjusted R2 for changes in career resources dimensions in the Blended Intervention Group (BIG) and the Distance Intervention Group (DIG)

Variables	Increment of change in career resources (β)							
	Knowledge and skills		Environment		Motivation		Career management	
	BIG	DIG	BIG	DIG	BIG	DIG	BIG	DIG
BPNS - Autonomy	-.20	.14	-.17	.16	-.08	.18	-.15	.14
BPNS - Competence	.26	-.11	.48*	-.13	.49*	-.16	.47*	.06
BPNS - Relatedness	-.12	.25	.06	-.02	-.17	-.06	-.21	-.20
IMI - Value/usefulness	.17	.08	-.03	.24	-.27	.46*	-.20	.21
IMI - Interest/ enjoyment	.14	.04	.12	-.19	.09	-.33	.31	-.18
Adjusted R^2	.04	.07	.17	-.04	.03	.03	.08	-.04

* $p < .05$

Discussion

This study aimed to contribute to the literature and practice by evaluating the effectiveness of an intervention program on career resources in a blended modality, integrated into the curriculum and a distance extracurricular modality, and exploring the relationship between the changes obtained after the program and motivational variables.

The results confirmed that participants of the career intervention in both modalities reported significant gains in career resources in three of the four dimensions evaluated. Therefore, both program modalities appear to be effective, adding to literature and research on career interventions (e.g. Kettunen & Sampson, 2019; Soares et al., 2022) and, particularly, supporting the effectiveness of distance career interventions (Carvalho et al., 2023; van der Horst et al., 2021).

Differences between the DIG and the BIG were found. BIG participants presented gains in all dimensions except for motivation, while DIG participants had gains in all dimensions except for environment. Additionally, the gains in the knowledge and skills dimension were greater for the participants in the DIG. Previous literature suggests that blended formats allow greater access to instructional resources and course elements that foster interactions among learners (Garrison & Kanuka, 2004; Means et al., 2013), which might lead to the expectation that the BIG would have better results. However, considering that the enrolment in the BIG was not completely deliberate, these additional resources might represent important elements to keep students engaged and contribute to some attenuation of the advantages of this modality.

Considering that career interventions in HE have evidenced consistent positive effects for students in the short and long terms (Reardon et al., 2024) and that completion rates are significantly higher for the BIG compared to the DIG (84.4% *vs.* 57.8%, in this study), blended intervention might represent a significant opportunity to reach and retain different publics to successful completion of the program, particularly more disadvantaged groups (Hunt et al., 2021). The findings align with previous literature emphasising the accessibility and completion advantages of blended learning formats (Gerbic, 2011; Hong Minh et al., 2023; Means et al., 2013), which could lead to increased career-related outcomes for diverse student populations.

Concerning the relationship between motivation and gains in career resources, the predictive power of the motivational variables is low and with greater relevance for the competence dimension in the BIG. A significant association between this SDT dimension and self-perceived overall learning was found in the study of Rowland (2016). However, previous research regarding the relationship between self-determined motivation in distance environments and results is ambiguous and seems to vary according to the outcomes considered and contexts. Chen and Jang (2010) found no significant association between self-determination and learning outcomes, while Hsu et al. (2019) found a significant relationship between self-determined motivation, achievement, and learning outcomes. Shah et al. (2021) suggest that the three basic needs of the SDT may mediate the relationship between online learning climate and student engagement. Therefore, although motivational factors do not seem to be determinant for improving career resources in this study, thus aligning with the previous findings of Chen and Jang (2010), it is possible that if different outcomes were considered, such as participants' engagement, different results might be obtained. Moreover, participants of the BIG scored higher in the dimension of relatedness, which is evidence that blended interventions can represent an advantage in terms of motivation, which aligns with previous research on blended learning (Chakawodza et al., 2024; Nass et al., 2023), particularly when the sense of belonging and connection is anticipated to be relevant (Reeve, 2002). However, relatedness does not appear to be central in the context of this intervention and regarding its specific purpose of promoting career resources. In turn, DIG participants perceived higher autonomy levels. This result is not surprising, considering that the decision to enrol in the program was completely self-determined in the case of the DIG. Moreover, BIG students were subject to evaluation, which may have, at least partially, conditioned their perception of autonomy (Deci & Ryan, 2000), as well as their motivation and persistence (Vaughan, 2014). The findings suggest that while autonomy may be more prominent in voluntary settings, the blended format could enhance other key motivational components like relatedness (Hsu et al., 2019; Ryan, 1982).

Regarding practical implications, this study's findings offer evidence that both blended and distance modalities can be effective, although with distinct advantages that might be taken into account according to the singularities of each context. Given the observed higher completion rates in the blended intervention, offered by curricular infusion, compared to the distance intervention, dependent on voluntary enrolment, interventions targeting vulnerable or less-motivated groups may benefit more from a more structured approach. Moreover, although the study found that motivational variables had limited predictive power regarding career resource gains, SDT components impacted participants differently across modalities. Blended interventions, developed through curricular infusion, could enhance competence, for example, through feedback to participants regarding practical activities of the interventions. Distance interventions could emphasize the perception of the value/usefulness of interventions, for example, through the adaptation of activities to directly relate to the participants' professional objectives. This study contributes to elucidating possible advantages and disadvantages inherent to some of the career intervention modalities proposed by Sultana (2012) while emphasizing that there is no "one-size-fits-all" model, as previously argued (Monteiro & Almeida, 2021b).

This study is not without its limitations. The two samples enrolled in the BIG and the DIG were not entirely in the same conditions, as the decision to enrol in the program was totally self-determined for the participants in the DIG but not for those in the BIG. Although these conditions of the study were relevant and necessary to practice, as they may inform decisions about the benefits of compulsory activities in a blended modality, further research aiming exclusively to understand the blended and distance modalities of intervention could consider samples in equivalent conditions. Additionally, future studies should consider incorporating motivation variables prior to the intervention in order to explore the relationship between self-determination factors and student program completion (Hernández-Arvizu et al., 2023; Reeve, 2002). Since the effectiveness of these career intervention programs may differ according to the scientific areas and the students' training stage, future research may address the impact of these variables.

To conclude, despite some divergence between blended and distance modalities of career interventions, this study shows that career intervention can be effective in both, contributing to the literature comparing the effectiveness of different online education modalities (Chakawodza et al., 2024; Gerbic, 2011; Hong Minh et al., 2023; Nass et al., 2023). Particularly, it adds to the literature on blended career intervention, which has scarcely been explored (Kettunen & Sampson, 2019), informing practice about the potential and limitations of different actions. Moreover, the results show that relatedness is higher in the blended format, while participants in the distance format reported higher levels of autonomy. However, in this study, motivation variables do not present a large predictive power for gains

in career resources, contributing to understanding the role of self-determined motivation in different settings and modalities of interventions (Ryan & Deci, 2017; Shah et al., 2021).

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