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Igor  
Rižnar

# Navigating micro-credentials: An analysis of student needs, perceptions and skills development at a Slovenian university

## Abstract

In this paper, the author analysed the responses to a questionnaire about micro-credentials of several groups of students studying at the Faculty of Management, University of Primorska in Slovenia in order to see how familiar they were with the concept, their perceived value of micro-credentials and their willingness to participate in such short courses. The study showed, first, that only a small number of students were well-acquainted with the concept; second, that students would be willing to attend such courses; third, that there were substantial differences between different groups of students regarding what they thought they needed the most. Based on the research, the author saw the potential of micro-credentials not only for bridging the skills gap and catering for labour market need, but also for acquiring new skills, upskilling and – in the case of Slovenian undergraduate and postgraduate students – for timely completion of their studies.

**Keywords:** competencies, employability, lifelong learning, micro-credentials, skills, up-skilling

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## Introduction

Micro-credentials (M-Cs) have gained substantial attention globally and within the European Union (EU) as a tool for addressing the skills gap, promoting lifelong learning and enhancing employability (Varadarajan et al., 2023, Wheelan & Moodie, 2021). M-Cs challenge traditional educational paradigms by introducing shorter, more flexible learning units (Council of the European Union, 2022, OECD, 2023).

One of the topics rarely discussed in the context of growing interest in M-Cs in the EU education area is the completion of studies, a topic of interest in countries where students need a considerable amount of time to graduate after they have passed all their exams. This is often due to the lack of certain academic, personal and professional skills required to complete their university education – skills that help students succeed in their studies while also preparing them for their future careers and personal development. These include skills in critical thinking, problem-solving, writing and communication, time management, analysis, self-motivation, technological proficiency, etc. Ubiquitous as such skills are in school curricula at HEIs worldwide, and often taken for granted by employers as being brought by graduates to the workplace, even undergraduates who have passed all exams may often lack them. According to OECD (2019) they belong to the group of skills that need to be constantly upgraded in both graduates and post-graduates.

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## Purpose and scope

This paper opens with a review of selected research literature, is followed by the method section in which we describe sampling, population and carry out statistical analysis. The paper concludes with a discussion of the results, research limitations and conclusions.

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### Literature review

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Research on M-Cs includes numerous academic papers, EU policy documents and reports, which aim at broadening the understanding of the current state and prospects of M-Cs. Topics range from giving a theoretical rationale for micro-credentials, including a definition (Brown & Mhichil, 2022; Brown et al 2021; Council of the European Union, 2022), to depicting their potential for the European education landscape (Futures et al., 2020) or providing a critical overview of micro-credentials (Ralston, 2021). Studies often focus on individual components of the concept of M-Cs – for instance, the so-called stackability (Fisher & Leder, 2022; Woods & Woods, 2021) or reskilling, upskilling (Zhang & West, 2020), or compare the hype about M-Cs with the hype about Massive open online courses (MOOCs) (Wheelahan & Moodie, 2021). Indeed, some researchers believe that M-Cs are only a marketing hype (Doran, 2017; Maloney & Kim, 2019).

A comprehensive review of literature can be found in Tamoliune et al. (2023), where the authors present an in-depth analysis of literature on M-Cs regarding the economic (reskilling and upskilling; employers' needs and employability), social (lifelong learning; career guidance and welfare) and higher education context (assessment and recognition; stackability; curriculum integration and learning design solutions). This review focused on the potential of M-Cs to support the post-COVID-19 pandemic recovery by offering opportunities to individuals to upskill, reskill and acquire new skills. The review advocated for a more integrative research approach, which would increase the understanding of the multidimensional impact of M-Cs.

Another review of the literature can be found in Varadarajan et al. (2023), where the authors analysed 60 publications about M-Cs in higher education published between 2015 and 2022 and concluded that different stakeholders have different expectations regarding M-Cs and that interaction among stakeholders is of utmost importance for their successful implementation. A comprehensive review of the literature can also be found in Ha et al. (2023), where the authors examined academic literature on M-Cs published between 2012 and 2022 and stressed that M-Cs could bring benefits to higher education, but also acknowledged that they were still in an early stage of development and that further research was needed to evaluate their long-term viability and effectiveness. In a meta-study by McGreal and Olcott (2022), the authors provide an introductory guide for university leaders about M-Cs, highlighting some of the challenges of standardising them across different countries. They also included examples of how different institutions had incorporated them and concluded by noting that M-Cs could complement other major initiatives within universities, but could not become a solution for all challenges nor a significant source of revenue.

OECD (2021) pointed out that while there were many innovative developments taking place at higher education institutions (HEIs), there was a lack of agreement about how MCs should be defined and implemented, which prevented both learners and employers from understanding their characteristics and benefits.

Another important literature review on M-Cs was featured in the special issue of the *International Journal of Education Technology in Higher Education*, where the editors (Mhichil et al., 2023) brought together diverse perspectives on M-Cs and arrived at the conclusion that the main challenge lies in demonstrating that M-Cs were worth taking and could truly aid learners.

The EU has issued several documents and communications on the topic of M-Cs (Council of the European Union, 2022; European Commission, 2020a; European Commission, 2020b), where guidelines for the development, issuance and recognition of M-Cs across the EU were provided. The documents and communications collectively outlined the EU's stance on MCs, highlighting their role in lifelong learning, employability and the recognition of skills and competencies by emphasising the need for their standardisation and quality assurance.

Lately, potential uses and benefits of M-Cs for lifelong learning and employability were discussed in a paper published by the OECD (2023). The article also discussed M-Cs' role in broadening pathways from upper secondary to higher education and the completion of the undergraduate studies, especially through modularisation and stacking. Oliver (2019) also reported that the completion time of the education was one of the difficulties that students in formal education were often faced with. The idea of using M-Cs to improve HE completion was also an important driving force for this present study's research.

Despite numerous journal articles, European activities and a variety of ongoing projects at higher education institutions in the European higher education area, many questions remain unanswered. A unanimous decision about the definition of the term has not been reached, there were doubts about the size in terms of credit points of these learning experiences, and diverse views regarding their overall design.

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### Research methodology

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#### Sample selection and questionnaire preparation

A total of 103 questionnaires were collected, of which 50 were filled in by the first-year students (31 of whose course was carried out in English), 38 by students on the vocational undergraduate programme/course and 15 postgraduate students.

For this research, the authors have chosen a combination of quantitative and qualitative research methods. In the initial stage of the questionnaire's preparation, the authors engaged with a focus group of second-year students ( $n=27$ ) to obtain information

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about their perceived importance of different skills, their familiarity with the concept of micro-credentials and their opinion about the role of M-Cs in HE.

At first, this group was not familiar with the term M-Cs, and thus did not have an opinion about their importance or the role they might have in HE. After a considerable amount of time during which the students became acquainted with the concept of M-Cs by studying documents available at <https://education.ec.europa.eu/education-levels/highereducation/micro-credentials> at home, and several subsequent long discussions about the relevance, benefits and challenges related to M-Cs, the students were asked to prepare a list of M-Cs that interested them most and which they would likely participate in if such short courses were offered by the Faculty of Management. This group of students was also asked to think about M-Cs in terms of learning experiences that would help them complete their studies in less than four years.

The list of M-Cs covering the following skills was proposed by the group of second year students: 1) time management skills; 2) negotiations skills; 3) public speaking skills; 4) basic coding skills; 5) leadership skills; 6) self-management skills; 7) general computer skills; 8) teamwork skills; 9) general communication skills; 10) self-motivation skills; 11) learning skills (learn-to-learn skills); 12) decision-making skills; 13) advanced coding skills; 14) critical-thinking skills; 15) problem-solving skills; 16) creative-thinking skills. See the appendix for more details.

Their choice of MCs seemed completely reasonable as M-Cs should cater for the needs of individuals (students or not), companies, and employees at all stages in their life. A micro-credential covering advanced coding is, on one hand, a highly demanded skill by many employers and, on the other hand, a vehicle for promoting lifelong learning. Many other M-Cs proposed by our second-year students can be seen as a helpful short learning experience helping them to get through their studies.

The World Economic Forum (WEF, 2023) proposed that analytical and creative thinking were the most important skills for workers in 2023. Among other important skills, the WEF also mentioned technological skills (technology adoption, big data, AI and cloud computing), problem-solving skills, systems thinking skills, lifelong learning and curiosity, resilience, flexibility and agility.

Time management skills help students to allocate time efficiently, which leads to better academic performance and reduced stress (Adams & Blair, 2019); negotiation skills can be used in group projects, as they aid students in resolving conflicts, collaborating effectively and advocating for their needs; public speaking skills are crucial for class presentations, debates and expressing ideas confidently (Taylor et al., 2008).

Developing public speaking skills may also prepare students for future professional roles (Grieve et al., 2021).

Understanding basic coding skills is important even if students do not pursue a tech career, because understanding coding fosters logical thinking and problem-solving and is advantageous for research, data analysis and an overall understanding of technology's impact on society (Kalelioglu & Gulbahar, 2014).

Leadership skills are valuable for group projects and future leadership roles, because they empower students to guide and inspire their peers (Uaikhanova et al., 2022). Self-management skills equip students with discipline, organisation and the ability to handle responsibilities effectively while balancing studies, part-time jobs and their personal life (Stan, 2021). As students rely heavily on computers for their research, assignments and communication, general computer skills enhance their productivity and information retrieval (Cadiz-Gabejan & Takenaka, 2021).

Teamwork skills are a must in many academic and extracurricular activities and help students collaborate, respect diverse perspectives and achieve common goals (Do & Nguyen, 2023). General communication skills are crucial for active class participation, discussions and relationship building as they foster better understanding and meaningful interactions (Shah et al., 2020). Good motivation skills help students set and achieve goals while being faced with academic challenges and distractions (Steinmayr et al., 2019). Learn-to-learn (or metacognition) skills enhance students' retention, adaptability and the ability to grasp complex concepts while learning and acquiring new knowledge (Abdelrahman, 2020).

Decision making skills not only aid students in evaluating options and choosing paths aligned with their aspirations when faced with challenges related to their coursework, but also help them in their private life (Majeed, 2021). In the technology-driven world, advanced coding skills may provide a competitive edge and open opportunities for internships and specialised roles for many students (Scherer et al., 2021).

Critical thinking skills help students evaluate information, analyse arguments and approach problems from different angles. This is an essential skill for academic essays, research and making informed judgements (Nor & Sihes, 2021). Problem-solving skills help students to tackle difficult situations, find appropriate solutions and adapt to changing circumstances, both in academic and personal life (Amran et al., 2019). Creative thinking skills foster innovation and unique approaches to assignments and projects and prepare students to tackle complex problems from fresh perspectives (Yang & Zhao, 2021).

Items 14 to 16 were not to include in the questionnaire (see the appendix), as the authors wanted to see how many respondents would mention them in the last item of the questionnaire, where they were asked to think about at least three M-Cs that were not included among the 13 items given. The plan was that these items would be added to the questionnaire in a subsequent study to see how many students would select them. The results for the 2022–2023 groups of first-year students showed that only a few

students mentioned them. The authors assumed that a considerably higher number of respondents would choose critical thinking, problem solving and creative thinking skills once they had become given items on the list.

The questionnaire was given to four groups of students (first-year university programme in Slovenian, first-year university programme in English, first-year vocational programme, second-year university programme and a smaller group of postgraduate students in the

Management M.A. programme) during lectures and took only five and ten minutes to complete. After a brief introductory note, respondents were asked to answer three general questions (in which year and programme of studies they were, how familiar they were with the term M-C, and if they believed M-Cs were adding real value in terms of learners' efficiency, effectiveness and productivity). In the fourth item in the questionnaire, respondents were asked which M-Cs they would attend if they had been offered by the institution where they studied. The last item required a longer response; namely, students were asked to think about two or three M-Cs they would add to the list of M-Cs.

The authors computed the means, medians, standard deviation and percentages of the gathered data. Non-probabilistic sampling was used for the research (the so-called "convenience sampling") to gather data from a sample that was easily accessible and readily available. This sampling method was chosen for its practicality as the aim was to obtain answers

from those students studying at the University of Primorska (UP).

## Results

The research showed that only 16.5% of respondents were familiar with the concept of M-Cs, 33% had heard about them, while almost half of the students were not familiar with the concept. These results were expected as Slovenian HEIs have only just started projects for their development and implementation.

As seen from Table 1 below, the respondents rated public speaking skills as most important (68% of respondents chose this item), self-motivation and decision-making skills were selected by approximately 55% of students, time management skill and leadership skills took third place, selected by 50% of respondents. Interestingly, and somewhat worryingly, three-quarters of students did not think they needed basic coding skills (24%), general computer skills (23%), or advanced coding skills (16.5%). On the other hand, they were fairly interested in negotiation skills (45.6%), but not so much in general communication skills (32%) and self-management skills (34%). M-Cs for improving teamwork skills would attract the attention of only a quarter of the respondents, as would the learn-to-learn skills (24%).

Descriptive statistical analysis showed considerable differences regarding the interest in the above skills among different groups of respondents, as seen in Table 2 and Table 3.

Overall, the scores show a mix of symmetrical and skewed distributions across different M-Cs. Some

**Table 1**

*Micro-credentials as selected by groups of students*

	Uni1_en n = 31 (%)	Uni1_sl n = 19 (%)	Voc1 n = 38 (%)	PostG n = 15 (%)
Micro-credential on				
time management	12 (38.7)	14 (73.7)	23 (60.5)	4 (26.6)
negotiations	11 (35.5)	10 (52.6)	20 (52.6)	6 (40)
public speaking	20 (64.5)	13 (68.4)	26 (68.4)	11 (73.3)
basic coding	9 (29)	8 (42.1)	4 (10.5)	4 (26.6)
leadership skills	11 (35.5)	10 (52.6)	24 (63.1)	8 (53.3)
self-management	11 (35.5)	10 (52.6)	9 (23.7)	4 (26.6)
general computer skills	10 (32.3)	4 (21)	7 (18.4)	3 (20)
teamwork	1 (3.2)	5 (26.3)	13 (34.2)	5 (33.3)
general communication	3 (9.7)	7 (36.8)	17 (44.7)	5 (33.3)
self-motivation	11 (35.5)	12 (63.1)	27 (71)	7 (46.7)
learning (learn-to-learn)	7 (22.6)	7 (36.8)	7 (18.4)	3 (20)
decision-making	16 (51.6)	13 (68.4)	17 (44.7)	10 (66.7)
advanced coding	9 (29)	5 (26.3)	2 (5.3)	1 (6.7)

Note. Uni1\_en – first-year English undergraduate university programme in Management

Uni1\_sl – first-year Slovene undergraduate university programme in Management

Voc1 – first-year English undergraduate vocational programme in Management

PostG – first-year postgraduate programme in Management.

Source: author's own work.



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**Table 2**

*Descriptive statistics by micro-credential*

Micro-credential	Mean	Median	Standard Deviation
time management	13.25	13.0	7.89
negotiations	11.75	11.0	6.50
public speaking	17.5	16.5	7.43
basic coding	6.25	6.0	2.36
leadership	13.25	11.0	7.24
self-management	8.5	9.0	3.32
general computer skills	6.0	5.5	2.27
teamwork	6.0	5.0	4.14
general communication	8.0	6.0	6.08
self-motivation	14.25	11.5	8.61
learning (learn-to-learn)	6.0	7.0	1.83
decision-making	14.0	14.5	3.08
advanced coding	4.25	3.5	3.59

Source: author's own work.

areas like basic coding and general computer skills have uniformly lower scores, while others like public speaking and self-motivation have higher average scores but also a wider range of scores (as indicated by the standard deviation).

A closer look at the standard deviation for the above micro-credentials indicated two things:

- a larger standard deviation (e.g. for “public speaking” or “time management”) meant there was a wider variation in the number of students across groups that had an interest in this M-C, which meant that certain groups were more interested in certain skills than other groups.

- a smaller standard deviation (e.g. for “basic coding”) meant that the number of students interested in such M-Cs was more consistent across the groups.

First-year university students in the English programme disagreed with their counterparts in the Slovenian programme with regard to almost all skills. They were either keener to join a MC if offered (in the case of general computer skills (32% vs 21%) or coding skills (29% vs 26%), or less keen (time management (39% vs 73%), leadership skills (35% vs 53%), teamwork skills (3% vs 26%), (self-)motivation (35% vs 63%). These two groups seemed to agree only about public speaking skills (64% vs 68%).

The group of postgraduate students also exhibited some differences from all three groups of first-year undergraduate students: only a quarter of them considered time management skills highly important but rated public speaking and decision-making skills highly (73% and 66.7%). On the other hand, only a few respondents would attend M-Cs in the areas of general computer skills (20%), learn-to-learn skills (20%) or coding skills (7%).

Respondents in the first-year vocational programme believed they should improve their self-motivation (71%), and their public speaking skills (68.4%), leadership skills (63%) and time management skills (60.5%). They would rarely attend M-Cs offering advanced coding skills (5%), basic coding skills (10.5%), general computer skills (18.4%), but would be willing to participate in M-Cs covering negotiations skills (52.6%), general communication skills (44.7%) and decision-making skills (44.7%).

The results also showed that slightly more than half of the respondents thought such courses might be useful (51.3%) or were even sure about this (20%). On the other hand, some respondents were not sure whether they were or were not useful (25%) and only

**Table 3**

*Percentages for each micro-credential across different student groups*

Micro-credential	Uni1_en	Uni1_sl	Voc1	PostG
time management	38.71%	73.68%	60.53%	26.67%
negotiations	35.48%	52.63%	52.63%	40.00%
public speaking	64.52%	68.42%	68.42%	73.33%
basic coding	29.03%	42.11%	10.53%	26.67%
leadership	35.48%	52.63%	63.16%	53.33%
self-management	35.48%	52.63%	23.68%	26.67%
general computer skills	32.26%	21.05%	18.42%	20.00%
teamwork	3.23%	26.32%	34.21%	33.33%
general communication	9.68%	36.84%	44.74%	33.33%
self-motivation	35.48%	63.16%	71.05%	46.67%
learning (learn-to-learn)	22.58%	36.84%	18.42%	20.00%
decision-making	51.61%	68.42%	44.74%	66.67%
advanced coding	29.03%	26.32%	5.26%	6.67%

Source: author's own work.

three students (2.9%) thought they did not add value to their learning experience.

Creative thinking skills were mentioned by only three students, problem-solving skills by 11 (10.6%) and critical thinking skills by 14 students (13.6%). On the other hand, students added a substantial number of different M-Cs to the list: 1uni\_en group added 32 items, 1uni\_sl added 26 items, 1Voc students added 14 items and PostG students added 21 items. Around 10% of students were interested in M-Cs that would improve their financial literacy skills or digital marketing skills (6%), and the list of skills the students were interested in also included the following: content creation skills; data analysis; environmental awareness; sustainability; data mining; foreign language skills; intercultural skills; project management skills; and change management skills.

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## Discussion

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This research showed several things: first, that students had limited awareness of micro-credential initiatives carried out by their HEI, but often knew in which areas they lacked skills or knowledge and would most likely be willing to improve them if M-Cs were offered by their HEI. Second, their opinion about upskilling, reskilling and acquiring new skills was not always shared with a management guru like WEF, or with their counterparts who participated in the questionnaire preparation, as they rarely mentioned the need for improvement in areas in which almost all stakeholders agreed were important (critical thinking skills, creative thinking skills, analytical skills, problem solving). Other important cognitive skills that were never mentioned by respondents were systems thinking, reading and writing skills and active listening skills.

The differences regarding the respondents' willingness to participate in M-Cs covering different skills could be explained by the fact that learners with no prior working experience rarely prioritised their skills in the same manner as more experienced postgraduate students, who were more familiar with business priorities and the efforts to close the skills gap.

The results also showed that the respondents rarely expressed the need to improve their technological literacy skills or basic coding skills, despite the huge impact these skills have on the graduates' employability potential.

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## Conclusion, limitations, future research and implications

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The responses gathered from the focus group (second-year students) and through the questionnaire showed that that even though students were not familiar with this relatively new concept, many of them expressed an interest in attending these short learning experiences and added several good suggestions for additional short courses that they thought they needed the most. Around 20% of the respondents were sure that M-Cs would add value to their learn-

ing experience, with an additional 51% believing that they might be useful, and less than a third thinking that M-Cs might not add a lot or any value to their learning experience.

This research focused exclusively on several groups of students enrolled in undergraduate and postgraduate programmes at the Faculty of Management at the University of Primorska in Slovenia. The convenience sampling used in this study prevented the researcher from making the findings universally valid and reliable, yet the findings might be valid for students who often need a longer period of time for the completion of their studies. The author hopes that teachers in higher education outside the Faculty of Management may use some of the findings of this research to help their students achieve their best through the introduction of micro-credentials that address the skills that their students need to upgrade to complete their studies in shorter time and to bring with them the skills that also matter to the job market. We focused on shorter courses for our current students to improve their academic work and their employability as many of these skills are extremely important both for their future personal lives and careers.

This research has several limitations: namely, it included only students from one country and one faculty at a single university. All other important stakeholders (HEIs, policymakers, businesses and teachers) were excluded from the research. Second, the sample was rather small as it amounted to only 103 respondents. Future research could focus on other stakeholders, or the analysis of existing micro-credentials offered by HEIs, either within one educational system or between different European or global tertiary education providers.

The research has several practical implications for the European HEIs in general and particularly for the university where the respondents currently study. First, it has raised awareness of the skills students thought they needed most or would most likely participate in had they been offered by their HEI. Second, if a M-C aimed at improving a certain skill is perceived by students as one they would not be willing to participate in, but is at the same time is considered very important by most stakeholders, HEIs should strive to popularise it and offer both ordinary courses and M-Cs to help students improve their skills. Third, the research could help in planning educational strategies, especially those that are related to the development and implementation of M-Cs. These strategies should focus on enhancing students' academic skills for graduating within a reasonable time frame and skills needed for entering the workforce with a competitive edge.

This study has several theoretical implications as it indirectly addresses the completion of undergraduate studies in the context of the increased interest in M-Cs in the EU. M-Cs can be seen as an alternative or supplementary form of acquiring skills needed for the completion of studies within a reasonable time frame.

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Future research could include other important stakeholders, as their perspectives would provide a more comprehensive understanding of the effectiveness and applicability of M-Cs in HEIs, both related to the completion of studies and to upskilling, reskilling and acquiring new skills. Once some of the above-mentioned M-Cs have been introduced at the Faculty of Management, University of Primorska, a longitudinal study could be implemented to track their long-term effects on students' academic success.

The appendix is available in the online version of the journal.

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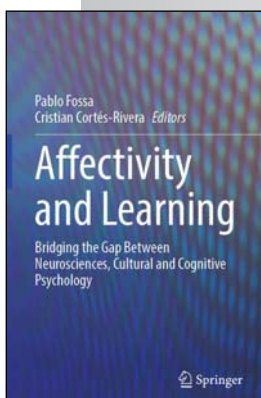
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**Igor Rižnar**, assoc. prof. dr., is a lecturer in Business English at the Faculty of Management, University of Primorska in Koper. He received his doctoral degree from the Faculty of Arts of the University of Ljubljana. His research interests include language management strategies and small and medium-sized enterprises, English for specific purposes, translation and localization, sustainable e-learning/teaching and pseudo profound discourse.

## WE RECOMMEND



**Pablo Fossa, Cristian Cortés-Rivera (Eds.)**

***Affectivity and Learning. Bridging the Gap Between Neurosciences, Cultural and Cognitive Psychology***

This book presents an interdisciplinary approach to the study of affectivity and human learning by bridging the gap between neuroscience, cultural and cognitive psychology. It brings together studies that go beyond the focus on cognitive-intellectual variables involved in learning processes and incorporate the study of the role played by affectivity and emotions in learning not only at educational settings but in all processes of transformation and human development, thus presenting affectivity as a catalyst and mediator of all daily learning processes.

Chapters brought together in this contributed volume present both theoretical contributions and results of empirical research from different disciplines, such as neuroscience, cognitive psychology, cultural psychology, educational psychology, developmental psychology and philosophy, and are grouped into five thematic sections. The first part of the book brings together chapters discussing different aspects of the role played by affectivity in learning processes from the perspectives of

cultural, educational and developmental psychology. The second part is dedicated to the role of affectivity for teachers during their training as educators and during their pedagogical practice in diverse contexts. The third part focuses on the relationship between affectivity and learning from a neuroscientific point of view. The fourth part discusses affectivity and learning in therapeutic and clinical contexts. Finally, the fifth part brings together chapters about affectivity and learning in everyday life.

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