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The pivotal role of students' absorptive capacity in management learning

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ABSTRACT

Within a research context dominated by an increasing interest in innovative learning methodologies in management education, an individual's capacity to establish links between existing and new knowledge, that is, absorptive capacity (AC), has been surprisingly neglected in management (higher) education inquiry. This study helps to close this gap by investigating the role of management students' AC on their academic performance. The study also examines the moderating effect on this relationship of using traditional learning methodologies (such as lectures), innovative learning methodologies (such as interacting with digital platforms), and having a cooperative climate in the classroom. Secondary and primary data are combined from samples of students enrolled in a strategic management course. Results show that students with higher AC achieve higher levels of academic performance. This relationship is moderated by the intensive use of traditional learning methodologies and by cooperative climates. Students who have higher AC benefit more from traditional learning methodologies and from a classroom with a cooperative climate than those with lower AC. Results will be useful to management education instructors, higher education administrators, and policymakers, when revising current educational programmes.

1. Introduction

Cohen and Levinthal (1990, p. 128) define absorptive capacity (AC) as "a firm's ability to recognise the value of new external information, assimilate it and apply it to commercial ends"; however, they also acknowledge that the concept of AC is based on research at the individual level. They suggest that relevant prior knowledge improves an individual's learning, memory, and problem-solving ability. In fact, empirical research on memory has shown that if individuals have prior knowledge of a topic, they are better able to store and recall information (e.g., Barfield, 1986), and solve problems (Voss et al., 1983). Some studies on individual AC have suggested that accumulated existing knowledge increases both the ability to put new knowledge into memory, referred to as knowledge acquisition, and the ability to recall knowledge and apply it (Cannon, Geddes, & Feinstein, 2014, March; Da Silva & Davis, 2011; Lowik et al., 2017, Yildiz et al., 2021).

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Students' AC is central to understanding both theory-based and practice-based approaches to learning, particularly in the field of strategic management teaching (Grant & Baden-Fuller, 2018), in which problem solving and strategic thinking[1] are key to students' understanding of how to develop strategies to increase organisational performance. That means taking a creative and proactive approach to address managerial problems from a holistic perspective.

Traditional learning methods, predominantly theoretical lectures (i.e., classes where the teacher is speaking most of the time, usually with minimal student participation or feedback), are extensively applied in management education (Ungaretti et al., 2015). However, innovative learning methodologies, such as flipped teaching (Boevé et al., 2017; Fernández-Mesa et al., 2016; Martínez-Jiménez & Ruiz-Jiménez, 2020; Tsai & Chiang, 2018; Wang et al., 2019), problem-based learning (Ahlfeldt et al., 2005; Ungaretti et al., 2015), action learning (Yeadon-Lee & Worsdale, 2012), experiential learning (Seow et al., 2019), project-based learning (Pan et al., 2021), or student-centred learning (Coleman & Money, 2020; Severiens et al., 2015), among other approaches, have been suggested to teach management skills (Daspit & D'Souza, 2012; Okolie et al., 2021). These innovative learning methodologies often improve educational outcomes (Beachboard et al., 2011; Daspit & D'Souza, 2012), particularly blended teaching, which combines traditional teaching with more innovative approaches (Daspit & D'Souza, 2012). Innovative teaching methodologies are usually framed as practice-based, as opposed to traditional theory-based approaches (Grant & Baden-Fuller, 2018).

This study enriches the debate on learning methodologies in management education by addressing a pertinent research gap: the lack of research on students' AC as a key predictor of academic performance. The investigation begins by arguing that the students' previous knowledge impacts their academic performance, and that learning methodologies (traditional vs. innovative) moderate this impact.

Moreover, cooperative climates may promote collectivistic values and behavioural integration in the classroom (Bogaert et al., 2012), having in mind that highly interactive, problem-solving-based methodologies are generally intensely cooperative (Thomas & Kilmann, 1974). Thus, cooperative climates reduce stress among students, enhance peer support and feedback, and optimise the impact of students' AC on their academic performance. A cooperative (learning) climate (Choi & Rhee, 2014) is therefore also considered as having the potential to affect the impact of students' AC on their academic performance.

This paper is organised as follows. The next section provides a review of AC, traditional learning methodologies, innovative learning methodologies, cooperative climate, and students' academic performance, and introduces the study hypotheses. The methodology, based on a sample of 228 students attending different strategic management courses, is explained in section 3. Study results are reported in section 4 and, in the final section, the findings are discussed, and concluding remarks and recommendations are presented.

2. Conceptual framework and hypotheses

In business degrees, appropriate learning of management skills has gained importance during the past decades (Daspit & D'Souza, 2012; Okolie et al., 2021). In particular, (strategic) management students need to be able to internalise, process and apply diverse knowledge in order to develop strategic thinking abilities (Napshin & Marchisio, 2017). Students can acquire this knowledge in different ways, such as by reading, watching videos, interactive classroom activities, conversations with classmates and instructors, and so forth. Notwithstanding, students vary in their abilities to assimilate and apply the knowledge they gain, and these abilities are related to their AC.

Having AC implies that an 'organisation' needs prior related knowledge to assimilate and use new knowledge (Cohen & Levinthal, 1990); hence individuals will also learn faster if they can access a knowledge base developed previously. Memory development is self-reinforcing because the more objects, patterns and concepts that are stored in memory, the more readily new information about these constructs is acquired, and the more easily new knowledge and skills can be applied in new settings (Bower & Hilgard, 1981). However, not only is it important to have prior knowledge; it is also important to learn how to learn, which leads to gradual improvement in learning performance or "learning to learn" (Estes, 1970). Having previous knowledge, even if it is unrelated to the new knowledge, is a sign that the individual knows how to learn. This implies that the individual has successfully used their learning capacities to retain knowledge. Based on this assumption, it is expected that students with a large store of knowledge will learn better that those whose knowledge store is poor.

Simon (1985) suggested that the possession of relevant skills and knowledge boosts creativity. This creativity is crucial in strategic thinking, which necessarily implies problem solving. Therefore, a large and diverse store of knowledge will help develop creative approaches to tackling problems, which are necessary for strategic thinking. Consequently, individuals with higher AC will be better equipped to link previous knowledge with new knowledge in a more creative way (thus generating strategic thinking), than those with lower AC. These arguments lead to the first hypothesis:

H1. Students' absorptive capacity is positively related to their academic performance in strategic management courses.

In addition to students' AC, consideration must also be given to the role of teaching methods (traditional vs. innovative) in predicting students' academic performance. Traditional learning methodologies (mainly theory-based approaches) are extensively applied in strategic management courses (Ungaretti et al., 2015). Traditional methodologies have been deemed appropriate for boosting students' academic performance, acting as a theory-based guide to strategic action (Buckley, 2018; Grant and Baden-Fuller,

[1] Strategic thinking in the context of firms' executives is a thought process in which executives develop a holistic understanding of the organisation and its environment, creativity, and a vision for the future of the organisation.

2018). This is especially relevant when (early years) university students are familiar with such methods from their high school education.

Thus, if strategy teaching is rooted in theory, students with the potential to become future managers will make sound strategic decisions based on understanding complex business situations through a cognitive framework derived from empirically validated theory (Grant, 2008). According to Buckley (2018), theory can improve strategy education and learning by examining how and why firms differ, and across which dimensions, and challenging students to explore the reasons for those differences. Thus, knowledge organised in such a structured manner and based on a clear cognitive framework will help students with high AC to acquire, assimilate and use this information.

In this context, students acquire knowledge mainly through reading and listening to knowledge organised systematically by instructors. Students with high AC connect this new knowledge to their existing knowledge base, which has been shaped during their high school years. As a result, their knowledge base is accustomed to theory-based approaches, and they will find it easy to assimilate and use this new information effectively. In line with this idea, traditional learning methodologies may be assumed to enhance the effect of AC on management students' academic performance. Thus, the second hypothesis is as follows:

H2. Intensive use of traditional learning methodologies positively moderates the relationship between students' absorptive capacity and their academic performance in strategic management courses.

However, traditional learning methodologies have been criticised for not always meeting future managers' needs, especially in terms of fostering creativity, problem-solving skills, and overall ability to face turbulent business environments (Bhardwaj et al., 2018; Ungaretti et al., 2015). There is now a great deal of support for the alternative use of innovative learning methodologies in the classroom. Studies increasingly highlight a positive relationship between innovative learning methodologies and educational outcomes (Ahlfeldt et al., 2005; Beachboard et al., 2011; Daspit & D'Souza, 2012; Lepistö & Hytti, 2021).

In this context, innovative – often IT-based – learning techniques can optimise students' academic performance when they are student-centred, with frequent interaction between students and the instructor (Beachboard et al., 2011). This enhances critical thinking (Okolie et al., 2021), which is essential for strategic management skills. Diverse innovative learning techniques have been studied and, among them, blended learning pedagogies (Bruggeman et al., 2021) deserve special mention. Blended learning combines traditional teaching activities (based on theory-based approaches) with more innovative, often IT-based ones, in order to optimise students' learning (Bonk & Graham, 2006; Daspit & D'Souza, 2009Daspit & D'Souza, 2009; Finlay et al., 2022). Blended learning approaches provide a balance between tradition and novelty, so educational innovation is applied, while at the same time also recognising the potential advantages of traditional methods and avoiding sudden changes in teaching methods that not all the parties involved (students, educators, administration, etc.) might fully accept.

For example, game-based learning (Coleman & Money, 2020), or gamification – understood as a specific type of learning methodology that applies IT-supported gaming elements in traditional learning contexts (Simões et al., 2013) – is used in blended learning environments and is becoming increasingly relevant (Hanus & Fox, 2015) as a springboard for fun-based activities that complement traditional ones (Fuβ et al., 2014; Gupta & Goyal, 2022). Gamification might modify traditional teaching practices in a positive way (Christensen & Raynor, 2013), facilitate frequent and immediate feedback to students and provide visual information of their progress (Kapp, 2012), and develop intrinsic motivation (Camilleri et al., 2011; Gupta & Goyal, 2022).

However, in a context of blended teaching, as instructors increase the number and intensity of the innovative methodologies used, students should be prepared to assimilate and benefit from these new types of learning processes. When the use of innovative methodologies is increased, students need to deal with a greater amount of new information, a challenge for which they might not be ready, so their ability to learn may eventually decrease and, consequently, their academic performance may deteriorate (Deci & Ryan, 2000; Ryan & Deci, 2020). However, this might be less challenging for students with high AC, because they can increase their internalisation, processing and application of the external information and knowledge acquired. Hence, using varied innovative methodologies intensively can reinforce the beneficial effect of AC on academic performance. Accordingly, the third hypothesis is as follows:

H3. Intensive use of innovative learning methodologies positively moderates the relationship between students' absorptive capacity and their academic performance in strategic management courses.

Furthermore, in strategy courses, students' performance often depends on their peers' performance (e.g., through group assignments). Therefore, students frequently face decisions about how much effort to contribute, and whether it is worth free-riding (Cox et al., 1991) (that is, behaving opportunistically and selfishly in a teamwork context). For instance, Urbig et al. (2016) argue that students are less inclined to positively contribute to a group in a foreign language setting than in one where their native language is used. Foreign language settings reduce individuals' emotional responses and make them feel less inclined to contribute, whereas native language settings help prevent individuals' free-riding behaviours and promote prosocial behaviours (Costa et al., 2014; Urbig et al., 2016). All in all, free-riding behaviours are unethical, and the lecturer must – by properly managing instruction methods and classroom environment – minimise as much as possible the risk of such unacceptable behaviours.

Cooperative climates have also been recognised as fostering prosocial and collectivistic values, behavioural integration and affective commitment (Bogaert et al., 2012). In classroom contexts, collaborative approaches to problem solving promote student interaction and assertiveness. Under the proper guidance of the teacher, cooperative climates send out a strong signal, indicating that students should foster cooperation and common goals related to good classroom functioning (Choi & Rhee, 2014; Lovelace et al., 2016). In contrast to collaborative problem solving, competitive problem solving prioritises personal goals over group goals (Thomas & Kilmann, 1974). Thus, cooperative climates are better than competitive climates at building trust effectively and managing conflict in a

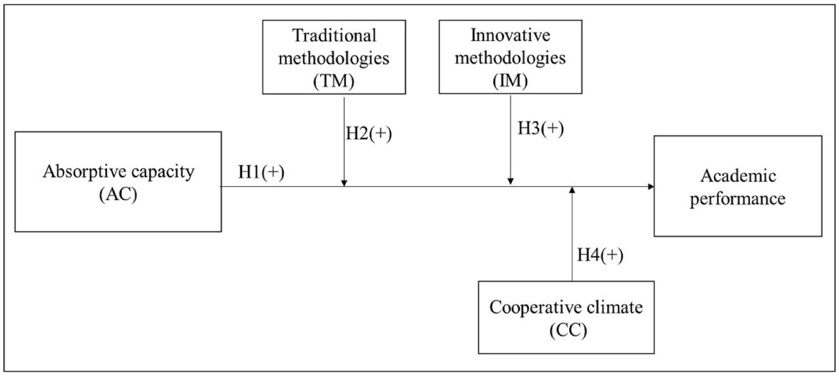

Fig. 1. Conceptual framework.

way that enhances performance (Chiocchio et al., 2011). Therefore, similar to what happens in native language settings, cooperative climates can reduce free-riding behaviours and motivate cooperative ones.

Individual characteristics can also affect free-riding behaviours (Urbig et al., 2016). For instance, extroverts tend to be more successful in cooperative situations (Beersma et al., 2003), and collaborative problem-solving mediates the relationship between individuals' critical thinking and performance (Lovelace et al., 2016). Similarly, students with high AC will be in a better position to benefit from the shared knowledge obtained from their peers, since their level of previous knowledge is already high (Cohen & Levinthal, 1990). Cooperative climates will increase the potential pool of knowledge to draw from, benefiting individuals with high AC. Moreover, students with high AC will benefit though the extra support and feedback they obtain. In contrast, students with low AC will not benefit from cooperative climates, since they might be overwhelmed with multiple information coming from different informants, and consequently these settings will be ineffective in supporting the learning process and strategic thinking. Accordingly, the fourth hypothesis is presented as follows:

H4. A cooperative climate in the classroom positively moderates the relationship between students' absorptive capacity and their academic performance in strategic management courses.

The complete conceptual framework, including all hypotheses, is shown in Fig. 1.

3. Methodology

3.1. Sample

The hypotheses were tested on a sample of 228 students enrolled in three mandatory (first and second year) strategic management courses taught by different instructors from the Faculty of Economics of the University of Valencia (Spain). Courses are disaggregated in groups, with tuition in English, Spanish or Valencian (an official language of the region). Six groups were analysed (four in Valencian, one in Spanish, and one in English).

3.2. Data collection

Two information sources were used. First, a questionnaire was developed to collect information on students' academic background (including university access grade), demographic characteristics, and information on their current strategic management course (instructor name, tuition language, learning methodologies, classroom climate). In particular, the questionnaire gathered data from which to construct the independent variables. A pilot test was conducted to check the validity of the questionnaire and to verify that the students understood the questions. Following the pilot test, the wording of some questions was changed, and the questionnaire was shortened. The questionnaire was distributed online after each teaching semester (September–January and February–June) of academic year 2015–2016.

Second, the dependent variable (academic performance) was measured with each student's official grade. Using multiple sources reduced common method bias problems and collecting data at two different points in time minimised endogeneity issues (Podsakoff & Organ, 1986).

A total of 231 completed questionnaires were received (final response rate of 54.4%). Because of missing data in the dependent variable (due to three exam no-shows), the final useable sample consisted of 228 questionnaires.

3.3. Measurement of variables

3.3.1. Dependent variable

The dependent variable, a*cademic performance,* is operationalised as a continuous variable that measures the final grade obtained by the student in the course at the end of the semester. As in Rode et al. (2005), two performance measures were used: continuous assessment grade and final exam grade. The activities carried out during the course, which involved different methodologies, were evaluated on a continuous assessment basis. In continuous assessment, evaluation mainly focused on the achievement of diverse competences through participative, creative, and critical thinking activities, such as problem-solving exercises, discussions around case studies, live presentations, and a teamwork-based company research project. In addition to continuous assessment, students sat a written exam at the end of the term. This exam assessed theoretical concepts and written analysis of case studies. A single measure of academic performance was constructed as a weighted average of both performance measures (final exam grade and continuous assessment grade), thus resulting in a continuous variable ranging from 0 to 10. Data on academic performance were not obtained through the questionnaire (as opposed to data gathered for the independent variables), but through the official university grades published at the end of the term.

3.3.2. Independent variable

The independent variable, *absorptive capacity*, has been conceptualised in the literature through a process-based perspective, which considers the relationship between different components. For instance, AC has been analysed taking into account two components: on the one hand, the firm's capacity to acquire and assimilate external knowledge (potential AC) and, on the other hand, the firm's capacity to transform and exploit this knowledge (realised AC) (Jansen et al., 2005; Zahra & George, 2002). Recently, other authors have proposed up to six components, such as in Ferreras-Mendez et al. (2019)Ferreras-Mendez et al. (2019). However, the concept of AC was a term originally coined by Cohen and Levinthal (1989, 1990), defined as the firm's ability to use prior related knowledge to recognise, assimilate, and use external knowledge for commercial ends; and measured with the proxy variable of Research and Development (R&D) expenditures. R&D expenditures reflect the traditional perception of AC as a general ability to absorb and utilise external knowledge.

Many recent papers have measured AC following Cohen & Levinthal (e.g., Østergaard & Drejer, 2021). Following Cohen & Levinthal's approach and transposing it to the education context, in this paper, students' AC is also captured with a proxy of prior related knowledge to recognise, assimilate and use external knowledge. Hence, in this study, AC is operationalised as a continuous variable that measures the student's university access grade. This grade is calculated, in accordance with Spanish education system regulations, as a weighted average of the high school academic record and university entry exam result. This variable may range from 5 to 14 (5 is the minimum grade for admission to university). Higher grades are considered a proxy that previous concepts have been understood, and this knowledge can be linked with the new knowledge gained during university courses. Consequently, the grade prior to university entry (publicly available in university admission lists) is used to measure students' AC.

3.3.3. Moderating variables

Items from Laursen and Salter (2006) were adopted to measure the intensity with which learning methodologies were used. To calculate these variables students were asked to evaluate, on a Likert scale from 0 (not used) to 7 (used a lot), the extent to which their lecturer used different teaching methodologies during the course (see Appendix). A score of 0 meant that the methodology was not used, while a score of 6 or higher indicated intensive use of the methodology.

Traditional methodologies (TM) was measured as a binary variable that took the value 1 if the student reported 6 or higher on an eight-point Likert scale indicating the intensity of the use of books and summary schemes (PowerPoint presentations) provided by the lecturer during the course, and 0 otherwise (i.e., the student reported values lower than 6, that is, from 0 to 5).

Likewise, the score assigned by the students to five innovative methodologies was considered to operationalise the variable *innovative methodologies* (IM) (see Appendix). As with the measure of traditional methodologies, a score of 1 was given if the student reported 6 or higher on an eight-point Likert scale, and 0 if he/she reported values from 0 to 5. As five different innovative methodologies were considered, the final measure was the sum of the dichotomous variables created, so the value ranged from 0 to 5.

Finally, class group *cooperative climate* (CC) was measured with a continuous variable adapted from the construct of Bogaert et al. (2012). This construct originally comprised three items, which were proposed in previous studies measuring related constructs such as "collectivistic values" (e.g., O'Reilly et al., 1991), "collectivistic culture and human resource management" (Baron & Hannan, 2002; Robert & Wasti, 2002), and "behavioural integration" (Boone & Hendriks, 2009; Li & Hambrick, 2005). In all these studies, measurement items refer to teamwork, cooperation and social integration. Two items from Bogaert et al. (2012), deemed to be most relevant in measuring class group cooperative climate in the research setting, were adapted for this study. Students were asked to evaluate, on a Likert scale, the extent to which they agreed with two sentences related to classroom climate (see Appendix). The resulting continuous variable measuring cooperative climate ranges from 1 to 7. As for the psychometric properties of this construct, content validity was established through a literature review. In addition, exploratory factor analysis was conducted to ensure the unidimensionality criterion (internal consistency) was met, showing that both items load on a single factor. Finally, Cronbach's alpha (0.848) posed no reliability concerns, showing an acceptable value above the 0.7 threshold (Ahire & Devaray, 2001).

3.3.4. Control variables

To avoid variability in the results, several aspects related to the respondents were controlled for. The first, respondents' *age*, has been included in previous research as a control variable for individual commitment (Ozag, 2006; Wang et al., 2010), which can be linked to higher academic performance. Similarly, students' *gender* was also included as a control variable. The third control variable was *tuition language*, in this case whether the course was taught in the students' mother tongue or a foreign language (Spanish, Valencian or English). Finally, the course *lecturer* was also taken into account as a control variable.

Table 1
Descriptive statistics (N = 228).

	Mean	SD	Min	Max
Academic performance	6.40	1.26	2	9
Absorptive capacity (AC)	9.34	1.89	5	13
Traditional methodologies (TM)	0.71	0.45	0	1
Innovative methodologies (IM)	1.53	1.30	0	5
Cooperative climate (CC)[a]	5.68	1.12	1	7
Foreign language	0.47	0.50	0	1
Women	0.57	0.50	0	1
Age	20.20	4.98	17	51
Lecturer 1	0.43	0.50	0	1
Lecturer 2	0.36	0.48	0	1
Lecturer 3	0.21	0.41	0	1

[a] Cronbach α = 0.848.

4. Results

4.1. Descriptive statistics

Table 1 reports mean values, standard deviations, and the minimum and maximum levels of the variables included in the analysis. For the dependent variable, referring to students' academic performance, the average value for the sample is 6.40 (out of 10), with a standard deviation of 1.26. Although it could be interpreted as a low value, if compared with the value of students' academic performance before university entrance (AC), the difference is not substantial. Indeed, on average, the value for students' AC is 9.34 out of 14 (equivalent to 6.67 out of 10). Regarding the other independent variables, results indicate that, on average, traditional methodologies (TM) scored 0.71 (out of 1), innovative methodologies (IM) scored 1.53 (out of 5) and cooperative climate (CC) scored 5.68 in a range from 1 to 7. As for the *lecturer* control variable, 43% of the sample was taught by lecturer 1, 36% by lecturer 2, and 21% by lecturer 3. The average age of the students was 20.20 years old, 57% were women, and 47% did not study the course in their native language.

Table 2 shows the values of the correlations between the independent variables included in the model. Additional analyses were performed to address potential multicollinearity problems; specifically, variance inflation factor (VIF) values were checked. Results indicate that the data does not suffer from multicollinearity problems, since none of the VIF values reach the critical value of 10 (Field, 2018).

4.2. Model fit

The continuous dependent variable (academic performance) follows a normal distribution, which suits the construction of a linear regression. A hierarchical analysis was chosen to assess the theoretical hypotheses since it allows the variables to be introduced progressively, thus verifying the individual effect of each new variable introduced into a baseline model. The first model is the baseline model which only includes the control variables. The second model considers the control variables and the independent variable of the model, namely AC. The third model adds to the previous model the three moderating variables of the AC–academic performance relationship: TM, IM, and CC. The last three models (Models 4, 5 and 6) include interaction effects between the independent variable (AC) and the three variables included in the previous model (TM, IM, CC), to assess how the relationship between AC and academic performance (dependent variable) may vary according to the effect of these three variables. Thus, taking Model 3 as the baseline, Model 4 adds the interaction related to the intensity of use of traditional methodologies (AC*TM), Model 5 adds the interaction referring to the intensity of use of innovative methodologies (AC*IM) and Model 6 adds the interaction related to cooperative climate (AC*CC).

Table 3 reports the six models assessed. First, the value of R^2 for the first model is 0.07, indicating that the model containing the control variables explains 7% of the variance of the dependent variable. The second model increases the R^2 by 10% compared to the first model; this is a significant change, which suggests that including AC explains a higher variance of the dependent variable (17% of the variance). For the third model, the change of the R^2 is not significant (increasing to 18%), which indicates that including the variables related to learning methodologies (TM, IM) and CC does not significantly explain students' academic performance.

The introduction of the interaction AC*TM in Model 4 is satisfactory since there is a significant increase of 2% on Model 3, showing that the moderation including AC and TM improves the fit of the overall model. Conversely, Model 5 shows no significant change in the R^2, which implies that it does not contribute to explaining students' academic performance better than Model 3. Finally, Model 6,

Table 2
Correlations between explanatory variables (N = 228).

	VIF	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Academic performance	–	1.00									
2. AC	1.91	0.24***	1.00								
3. TM	1.09	−0.05	−0.07	1.00							
4. IM	1.24	−0.18***	−0.03	0.22***	1.00						
5. CC	1.14	0.05	0.09*	0.13**	0.21***	1.00					
6. Foreign Language	1.21	0.04	0.34***	−0.01	−0.02	0.08	1.00				
7. Age	1.71	0.12**	−0.46***	0.01	−0.13**	−0.01	−0.24***	1.00			
8. Man	1.08	−0.01	−0.08	−0.05	0.02	−0.22***	−0.01	0.08	1.00		
9. Lect. 1	3.45	0.07	0.58***	−0.12**	0.15**	0.09*	0.20***	−0.32***	0.01	1.00	
10. Lect. 2	2.64	−0.22***	−0.26***	0.11**	−0.06	0.00	−0.07	−0.16***	0.01	−0.65***	1.00
11. Lect. 3	–	0.17***	−0.40***	0.02	−0.27***	−0.12*	−0.34***	0.58***	−0.02	−0.45***	−0.39***

Note: *p < 0.10; **p < 0.05; ***p < 0.01.

Table 3
Linear hierarchical regression. Dependent variable: Academic performance (N = 228).

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Control variables						
Language	0.27	0.07	0.04	0.07	0.06	0.03
	(0.17)	(0.17)	(0.17)	(0.17)	(0.17)	(0.17)
Age	0.01	0.04**	0.04**	0.04**	0.04*	0.04**
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Gender	−0.01	0.06	0.10	0.08	0.11	0.08
	(0.17)	(0.16)	(0.16)	(0.16)	(0.16)	(0.16)
Lecturer 1[a]	−0.33	−0.79***	−0.70**	−0.69**	−0.69**	−0.68**
	(0.27)	(0.28)	(0.29)	(0.29)	(0.29)	(0.29)
Lecturer 2[a]	−0.79***	−0.74***	−0.69***	−0.71***	−0.68**	−0.68***
	(0.27)	(0.26)	(0.26)	(0.26)	(0.26)	(0.26)
Independent variables						
AC		0.28***	0.27***	0.14*	0.26***	0.25***
		(0.06)	(0.06)	(0.08)	(0.06)	(0.06)
TM			−0.04	−0.06	−0.04	0.01
			(0.18)	(0.18)	(0.18)	(0.18)
IM			−0.10	−0.10	−0.10	−0.10
			(0.07)	(0.07)	(0.07)	(0.07)
CC			0.08	0.09	0.08	0.07
			(0.07)	(0.07)	(0.07)	(0.07)
Interactions						
AC*TM				0.19**		
				(0.09)		
AC*IM					0.04	
					(0.03)	
AC*CC						0.07**
						(0.03)
Constant	6.70***	6.95***	6.91***	6.94***	6.89***	6.87***
	0.22	0.21	0.26	0.26	0.26	0.26
R^2	0.07	0.17	0.18	0.20	0.18	0.20
Adjusted R^2	0.05	0.14	0.14	0.16	0.14	0.16
Increase in R^2		0.10***	0.01	0.02**	0.00	0.02**
F-statistic (df)	3.21 (5, 222)	7.27 (6, 221)	5.18 (9, 218)	5.22 (10, 217)	4.83 (10, 217)	5.20 (10, 217)
Significance	0.01***	0.00***	0.00***	0.00***	0.00***	0.00***

Note. Numbers presented in the table are rounded.
[a] Lecturer 3 is the reference category.

which includes the interaction AC*CC, shows a better fit than Model 3, with a 2% increase of the R^2, suggesting that the moderation including AC and CC improves the fit of the overall model.

4.3. Hypotheses testing

Table 3 shows how the six models assessed identify the direct and indirect (moderating) effects that the independent variables have on academic performance. Models 2 and 3 assess the direct effect of the different independent variables on academic performance. First, results indicate a positive and significant direct effect of AC on academic performance. This suggests that students with higher AC (better grades before entering university) have a higher academic performance, suggesting that Hypothesis 1 cannot be rejected. Regarding the direct effect of the other three independent variables (TM, IM and CC), results from Model 3 show no significant direct

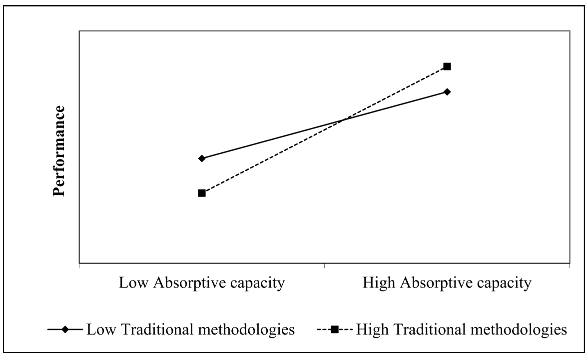

Fig. 2. Moderating effect of traditional methodologies.

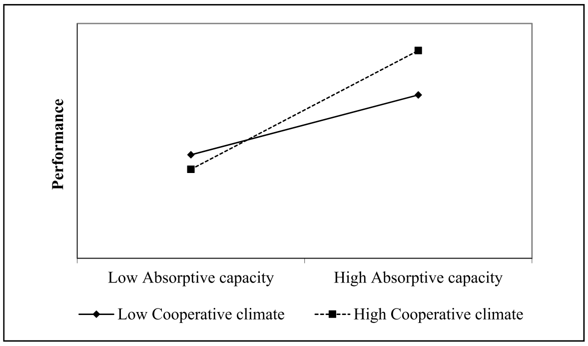

Fig. 3. Moderating effect of cooperative climate.

relationship between any of these three variables and academic performance.

Regarding the moderating role of TM (Model 4), results indicate that Hypothesis 2 cannot be rejected, since the coefficient of the interaction between AC and TM is positive and significant. This suggests that an implementation of traditional learning methodologies strengthens the positive effect of AC on academic performance. Fig. 2 illustrates the moderating effect of traditional learning methodologies between AC and academic performance when TM is fixed by its arithmetic mean+/-its standard deviation. At high levels of TM, the positive effect of students' AC on academic performance becomes stronger.

As for the moderating role of IM (Model 5), results indicate that Hypothesis 3 must be rejected, since the coefficient of the interaction between AC and IM is not significant. This suggests that an intense implementation of diverse innovative learning methodologies does not affect the positive effect of AC on academic performance.

Finally, Hypothesis 4, on the moderating effect of CC, cannot be rejected since results indicate a positive and significant coefficient, corresponding to the interaction between AC and CC (Model 6). The higher the cooperative climate, the stronger the positive effect of AC on academic performance. The moderating effect of CC between AC and academic performance is illustrated in Fig. 3, when CC is fixed by its arithmetic mean+/-its standard deviation.

5. Discussion and conclusions

This paper studies the effect of management students' AC on their academic performance, and the contingent effect of the intensity of traditional/innovative learning methodologies and of cooperative climates.

Results show students with high AC will achieve higher academic performance in strategic management courses, and that this effect will be – consistent with the hypothesised effect – boosted when there is an intensive use of traditional learning methodologies in the classroom. Traditional learning methodologies could be appropriate for students with high AC, since they give clear guidance in the learning process and include methods familiar to students that facilitate learning through path dependency mechanisms. Accordingly, results show that for those students with lower AC grades are also lower. For these students, the intensive use of traditional methodologies diminishes their academic performance. This result may indicate, among other factors, that students with low AC may need alternative pedagogical methods that suit their specific learning needs better than traditional ones.

In addition, the findings show that in cooperative climates the relationship between students' AC and their academic performance is enhanced. Classrooms with a high cooperative climate increase the performance of students with high AC. These students take advantage of a wider potential pool of knowledge to draw from, facilitated by the combination of the teams' knowledge bases, since their level of previous knowledge is already high. In contrast, cooperative climates do not seem to help the students that had low prior AC. A plausible explanation is that they may be overwhelmed by the amount of information and may not have the capacity to absorb it all, thus limiting the potential of teamwork and cooperative climates.

Results also show that, contrary to the hypothesised predictions, an intensive use of innovative learning methodologies does not affect the impact of students' AC on their academic performance. It is surprising that a cooperative climate benefits students with high AC, but innovative learning methodologies do not. The hypotheses implied that both variables (cooperative climate and intensive use of innovative learning methodologies) were associated to a greater capacity of students to use high amounts of information. An explanation for the unexpected results obtained in the case of innovative methodologies can be based in the diversity of such methodologies used in this study. For example, the Kahoot tool does not need a high amount of information, in contrast with the use of databases. In some situations, certain combinations of innovative methodologies might work better than others. For instance, innovative pedagogical methods fostering individual learning could be better suited for low AC students. In this sense, further studies could focus on those specific innovative methods which may positively impact the learning of low AC students.

Moreover, an explanation for this non-significant result could also be related to the way students' AC was conceptualised, measured and analysed in this investigation. AC is a complex concept and originates from organisational research. Studies on individual AC have suggested that accumulated existing knowledge favours the process of acquiring, assimilating, and using new knowledge (Cannon et al., 2014, March; Da Silva & Davis, 2011; Lowik et al., 2017, Yildiz et al., 2021). Following this conceptualisation, this construct is – simplistically – operationalised in this study as students' prior grades. The underlying rationale is that prior grades are linked to previous student academic (un)success, inevitably influencing future academic outcomes. This view of AC is particularly related to the notion of knowledge assimilation, where new knowledge is accommodated in the context of existing knowledge. Hence, knowledge transformation – implying deeper (transformational) learning and a structural shift in thought processes and view of the world – exceeds the scope of AC measurement in this paper. Nevertheless, this measurement limitation can be overcome by future studies, considering more comprehensive measures of AC which more consistently match its theoretical conceptualisation as a learning process. A starting point for future studies could be to further adapt and refine constructs from management research to the educational context. Doing so would help to better ascertain whether learning deficiencies in low AC students are attributed to inadequate knowledge assimilation or to other learning dimensions, particularly knowledge transformation.

To further understand the non-effect of innovative learning methodologies in the relationship between students' AC and academic performance, it is also important to analyse more closely the assessment methods used to evaluate the academic performance of the students who made up the sample of this study. Such assessment methods include a theoretical final exam, which accounts for a high percentage of the final grade. Student learning is highly sensitive to assessment methods – especially in the case of high achievers. Hence, traditional assessment approaches – which usually include theoretical exams – will encourage students' preference for traditional learning methodologies. This opens an opportunity for further research into the role of assessment practices (Fletcher et al., 2012; Winstone & Boud, 2020) within the broader consideration of (traditional vs. innovative) learning methods.

In summary, this paper contributes to the debate on traditional versus innovative learning methodologies in higher education, particularly in the field of (strategic) management (Buckley, 2018; Lepistö & Hytti, 2021). This investigation reinforces the idea that intense use of traditional learning methodologies positively moderates the relationship between students' AC and their academic performance. The study also contributes to the literature by suggesting that contextual factors (Beachboard et al., 2011; Fletcher et al., 2008), such as cooperative climate, play a similar role to the use of traditional learning methodologies in the relationship between students' AC and their academic performance in strategic management courses. Thus, students with high AC are better placed to take advantage of the new knowledge, since their level of previous knowledge is already high, which in turn will place them in a better position to benefit from traditional methodologies and cooperative climates. However, it must be acknowledged that students with high AC will learn under multiple conditions. They are often conditioned to be passive learners via traditional learning methodologies, since they are used to learn in this way, and have developed strategies for optimising outcomes from traditional learning approaches. Interesting insights also come from results regarding low AC students, which show that traditional methodologies and cooperative climates seem to be counterproductive for these students. It is important to reiterate the relevance of further research into innovative methodologies (probably oriented towards individual and personalised learning) that could improve the learning of students with low AC.

A limitation of this study is that data collection was restricted to a single university and subject. Institutional contexts matter and are not equitable across university programmes and countries (Edwards-Schachter et al., 2015). Caution should therefore be taken when generalising the results to other higher education institutions or contexts; future studies may consider heterogeneous institutional settings. With regards to the course, the study sample comprised students in a strategic management course. However, the influence of AC on students' learning and the role of moderating variables is relevant beyond the scope of the context of this study, and could be applied in a wider setting. Finally, qualitative research could also improve further research endeavours, providing a deeper understanding of the constructs and dynamics that offered unexpected results in this study.

This study has relevant implications for university instructors, higher education administrators, and policymakers. Results suggest that education programmes in (strategic) management should consider students' prior knowledge when designing innovative learning methodologies, as well as the climate that should be generated in the classroom. Often, innovative methodologies have been regarded as the solution to deficient learning in management (Daspit & D'Souza, 2012; Ungaretti et al., 2015). However, this study highlights that innovative learning methodologies need to be studied more closely and should be designed considering students' AC. Thus, to better align with society's demands for creative and innovative skills, the conditions under which these methodologies perform well must be identified and carefully analysed.

Author statement

Anabel Fernández-Mesa: Conceptualization, Methodology, Formal Analysis, Resources, Data Curation, Validation, Investigation, Writing - Original Draft, Writing - Review & Editing, Visualization, Supervision, Project Administration, Funding Acquisition, **Julia Olmos:** Conceptualization, Methodology, Validation, Formal Analysis, Resources, Investigation, Writing - Original Draft, Writing - Review & Editing, Visualization, Supervision, Data Curation, Funding Acquisition, **Ana García-Granero:** Conceptualization, Methodology, Validation, Formal Analysis, Resources, Investigation, Writing - Original Draft, Writing - Review & Editing, Visualization, Supervision, Data curation, Funding Acquisition, **Victor Oltra:** Conceptualization, Methodology, Formal Analysis, Resources, Investigation, Writing - Original Draft, Writing - Review & Editing, Visualization, Supervision.

Declaration of competing interest

None.

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APPENDIX. List of items included in the questionnaire related to the moderating variables

Learning methodologies

Please indicate the degree to which the following learning methodologies were used during the course (0 = not used; from 1 = little used to 7 = used a lot)

Traditional learning methodologies:

- Studying with traditional methodologies (through PowerPoint presentations provided by the teacher and books)

Innovative learning methodologies:

- Watching videos in class not made by other students
- Using databases (such as SABI or FACTIVA) during the course
- Using Kahoot during the whole course
- Making theoretical videos to explain concepts to other students in the class
- Making short films to highlight a firm's strategy

Cooperative climate:

Please indicate to your level of agreement with the following sentence (1 = completely disagree, 7 = completely agree):

- My class is team-oriented, teamwork is strongly valued
- In my class, cooperation is judged to lead to success

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