

## Article

# Exploring the Knowledge Management Impact on Business Education

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**Abstract:** Knowledge management developed in the last decades as a dynamic symbiosis between science and art with significant implications on business and business education. Knowledge management operates within the organizational management, but it focuses on intangible resources, which are distinguished from the tangible ones as a result of their abstraction, metaphorical semantic, and nonlinearity. The purpose of the present paper is to explore the impact of knowledge management on business education through the mediation of academic curriculum and the influence of the business environment. The methodology is based on both qualitative and quantitative research methods. The qualitative phase focuses on a critical literature search and a semantic analysis of the main concepts and ideas, which allowed us to construct the research model and design a questionnaire addressed to business students and professors. The quantitative approach uses the statistical software packages SPSS 26.0 version, including the PROCESS macro for SPSS version 3.5 and the known reliability, validation, and interpretation criteria. Findings show that knowledge management impacts business education through the mediation of the academic curriculum and the influence of the business environment. The originality of the present research comes from the dynamics between knowledge management and business education and the research model's design.

**Keywords:** academic management; knowledge management; business education; competencies; business environment; cross-sectional design



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## 1. Introduction

Peter F. Drucker was one of the first visionary authors to anticipate the emergence of the new economy propelled by *knowledge*. He remarked that “Knowledge, during the last few decades, has become the central capital, the cost center, and the crucial resource of the economy. This changes labor forces and work, teaching and learning, and the meaning of knowledge and its politics” [1] (p. XXIX). He coined for this new economy the terms “knowledge economy”, “knowledge work”, and “knowledge worker”. Within the new economy, knowledge is conceived as a resource for production, which is a resource with different characteristics than the tangible resources used so far. Powell and Snellman define the *knowledge economy* as “production and services based on knowledge-intensive activities that contribute to an accelerated pace of technical and scientific advances” [2] (p. 1999).

Knowledge assets are distinct from physical assets as a result of their fundamental properties of intangibility and nonlinearity [3–6]. The first property, intangibility, means that knowledge is a concept without any direct physical reference. It cannot be seen, it cannot be touched, and as a consequence, it cannot be measured by using the metrics designed

for physical properties. Knowledge can be understood only by using metaphorical thinking [7–9]. The second property, nonlinearity, tells us that knowledge cannot be processed by using linear algebraic operations such as summation or multiplication. The knowledge of a group of people cannot be obtained by summing up the individual knowledge of all the group members. Unfortunately, some authors make this elementary mistake. The knowledge of the group can be obtained by integration, which is a process that allows for the synergy effect [10,11]. This process includes all communications among the members of that group, which contribute to the SECI dynamics and knowledge spiral introduced by Nonaka and Takeuchi [3]. The dynamic model of knowledge creation developed by Nonaka and Takeuchi is fundamental in realizing the dynamic capabilities for achieving a competitive advantage and the critical conditions for the firm's sustainability in a turbulent business environment [4,6,11].

From the economic point of view, knowledge is a non-depleting resource because it does not disappear when it is consumed in a production process [12,13]. While physical resources go away when they are consumed in a production process, knowledge keeps its integrity. Instead of knowledge scarcity, we may discuss knowledge abundance, which leads to non-competitive markets. Knowledge is a public good. As Handa, Pagani, and Bedford posit, a public good is one that is non-rivalrous and non-excludable. "Non-rivalrous means it can be consumed by a collective of consumers", while "Non-excludable means if one individual consumes the good, the amount of good is not reduced—the good is still available for consumption by others" [12] (pp. 93–94). Knowledge is open and collaborative, having permeable boundaries. Knowledge is created by individuals, and then it is evolving in time within a social context similar to a spiral [14–16].

In the knowledge-based view of the firm, knowledge is considered a strategic resource because it is valuable and costly to imitate when used for new products and services [17–19]. Here, we have to emphasize the role played by the tacit knowledge that is created by our direct experience and processed by the unconscious cognitive brain zone [20–23]. According to Nonaka and Takeuchi, "Tacit knowledge is personal, context-specific, more closely tied to human emotions, and therefore hard to formalize and communicate. Tacit knowledge is deeply rooted in an individual's actions and bodily experience, as well as in the subjective intuitions, instincts, and ideals" [3] (p. 27). Tacit and explicit knowledge constitutes the raw materials for developing the knowledge capabilities and competencies of the firm as well as constructing the premises for its competitive advantage [24–26].

Within the framework of the knowledge economy and the new challenges raised by knowledge in organizations, it is easy to understand the emergence of *knowledge management* as a new managerial field of activity dealing with knowledge resources, knowledge workers, and knowledge processes [3,4,6,15]. Knowledge management does not replace the classical management dealing with tangible resources, but it enriches a firm's management with its capacity of dealing with intangible resources and their specific processes of creation, acquisition, sharing, transferring, transformation, and use in the production of goods and services [27–29]. In addition, knowledge management is not an extrapolation of information management focused on the efficient use of information technology and *data* and *information* as intangible resources [30–32].

Knowledge management is vital for developing organizational learning phenomena [33,34], which lead to learning organizations [35–37]. *Organizational learning* is a complex process of learning by a group of people or a whole organization as a result of some strategies initiated by the knowledge managers. Organizational learning becomes necessary, especially when the business environment is changing fast and it is disrupted by economic crises. The complex crisis generated by the COVID-19 pandemic can be a useful example of how organizational learning helped firms implement new working programs [38–40]. According to Senge, "A learning organization is a place where people are continually discovering how they create their reality. And how they change it" [35] (p. 13). A *learning organization* develops the second loop of learning and generative learning; it is a learning that is based on entropic, nonlinear, probabilistic, intelligent, and creative

thinking. Knowledge is a strategic resource, and knowledge management integrates both the operational and strategic perspectives of any organization [3,6]. Knowledge strategies designed for reducing knowledge absence and creating generative knowledge contribute directly to the sustainability of business in a changing environment [11,26].

Knowledge management developed mostly in the knowledge-intensive organizations because of the dominance of intangible resources and knowledge capabilities. Universities are such knowledge-intensive organizations, and that is a crucial argument as to why knowledge management impacts the whole academic management and leadership as well as the students' education. Although universities are based on teaching and learning processes, they are not, by definition, learning organizations. They must develop powerful knowledge management systems and design knowledge strategies for becoming learning organizations characterized by generative learning processes [41–43]. Moreover, universities should be aware of the volatile, uncertain, complex, and ambiguous (VUCA) business environment due to significant job markets changes. The present students will face in the next 10–20 years new challenges for their employment because some of the jobs will disappear, while new jobs with new requirements will be created [44,45]. Such job market dynamics request a paradigm shift in business education from knowledge transfer and accumulation to a competence-based approach [46–48].

All of these changes described above should be reflected in the dynamics of business schools governance and in their business education programs. However, our investigation of research into higher education found a scarcity of papers focusing on the impact of knowledge management as an integral part of academic management on business education. For a better understanding of this knowledge gap, it is important to go beyond the linear correlations and to introduce some mediation effects.

The purpose of the present research is to analyze the impact of knowledge management on business education, with the mediation effect from curriculum and business environment. Thus, we want to integrate in the research model some of the key constructs in this complex process, namely, academic management, knowledge management, curriculum, business environment, and business education. The research question we try to answer is the following:

*RQ: How does knowledge management impact business education through the mediating processes of curriculum and the business environment?*

Due to the complexity of the whole process, the research question RQ will be decomposed into three subsidiary research questions as follows:

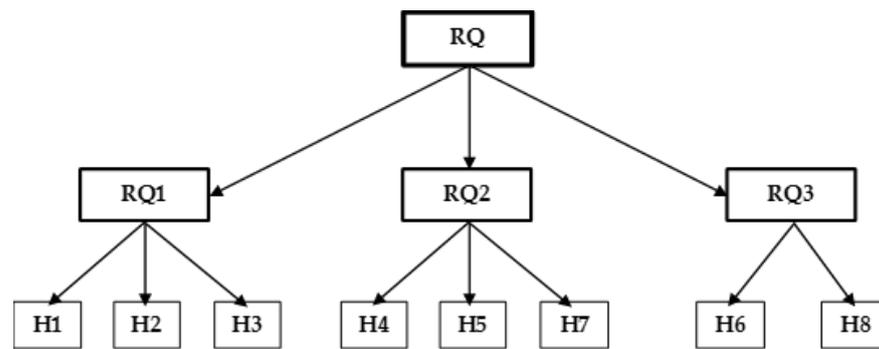
*RQ1: What is the relationship between academic management and knowledge management?*

*RQ2: What is the relationship between knowledge management and business education through the mediation of curriculum?*

*RQ3: What is the relationship between knowledge management and business education through the mediation of business environment?*

The analysis is based on qualitative and quantitative research. The inquiry is being addressed through a questionnaire to the faculty staff and students in business and management programs of the National University of Political Studies and Public Administration and the Bucharest University of Economic Studies, Romania.

To better integrate the general purpose statement that establishes the central direction of the study with the specific questions meant to test the predictors based on the hypotheses, a graphical representation of the research design is presented in Figure 1. Hypotheses H1 through H8 will be formulated in the next section based on the qualitative analysis of the literature.



**Figure 1.** Correlations between the research questions and hypotheses.

The remainder of the paper is structured as follows. The next section presents a critical review of the literature dealing with the interface between knowledge management and business education. Then, we present the research design and the methods used, which is followed by results and discussions. Finally, we formulate the conclusions and limitations of this research.

## 2. Literature Review

### 2.1. Knowledge Management in Universities

Knowledge-intensive organizations are based on processing mainly intangible resources to produce goods and services. Data, information, and knowledge constitute their raw materials, which are transformed and embedded into the outcomes of the production processes [49–51]. In addition, they are characterized by the dominance of the intellectual capital [52–54] or knowledge capital [12,24].

Universities are knowledge-intensive organizations because all the basic processes employ data, information, and knowledge. Teaching is essentially a transfer of knowledge from professors to students, but it involves many activities and tasks of data, information, and knowledge collection, selection, structuring, and integration into ideas and theories, which correspond to a certain conceptual framework. Teaching can be performed directly in classrooms or online by using specialized platforms and indirectly through a series of printed materials or stored documents in databases. Teaching also involves knowledge sharing that reflects professors' experience. Teaching methods can be grouped into three categories: (a) teacher-centered methods; (b) student-centered methods; and (c) teacher–student interactive methods [55,56]. The last group of methods stimulates students to become active participants of the teaching process, which is focused on developing students' thinking power.

Learning is the complementary process of teaching and is performed by students. Thus, teaching effectiveness depends on the learning capacity of students and their motivation. “Cognitive theorists see learning as an internal process and contend that the amount learned depends on the processing capacity of the learner, the amount of effort expended during the learning process, the depth of the processing, and the learner's existing knowledge structure” [57] (p. 19). Thus, the knowledge transfer is a conditioned process by the absorptive capacity and motivation of students and moderated by the teaching methods and technologies used [58–60].

The blending of online learning imposed by the COVID-19 crisis in many countries was a dramatic test for all professors, students, the academic management of the universities, and their knowledge management systems [38–40]. Since learning is “an internal process that involves memory, thinking, reflection, abstraction, motivation, and metacognition” [57] (p. 21), the technology used is less important than the strategies developed to design and construct the learning materials. The final result should attract the students' curiosity and challenge their thinking in participating actively in the online dialogue with their professors. Designing the learning processes for students is a specific activity of

knowledge management that can be extended to organizational learning by increasing their complexity and scale.

For the research universities, the process of knowledge creation constitutes the third fundamental dimension after teaching and learning. Research activities are involved, especially within the master and doctoral programs, but they can be developed independently by researchers within some research grants or projects. To manage all of these processes, universities create research centers and institutes whose mission is knowledge exploration [61–63]. Managing knowledge creation is an important part of the university knowledge management. Managing knowledge creation also integrates activities that are specific to knowledge acquisition, knowledge storage and retrieval, and knowledge dissemination through publication.

Depending on the characteristics of the research domain, knowledge creation may also lead to patents and other forms of intellectual property, which can be transferred toward society. That is a direct result of developing the third mission of the university [43] that is focused on knowledge exchange with the community and industry. In addition, there is a growing interest on constructing a more complex model of cooperation among university, industry, and the government known as the triple helix model [64]. “A triple helix is an invisible institutional tool and dynamic mechanism, driving regional innovation. It is also a universal approach to maintaining an innovation ecosystem’s and economic sustainability in a region” [65] (pp. xii–xiii). The triple helix is conceived as a dynamic model because each component has its own contribution that is changing in time through the intensity of the knowledge flow. As Etzkowitz, Zhou and Leydesdorff show in their research, the triple helix has a transformational role for a given community contributing significantly to a sustainability effect on the innovation process [64,65].

Being a dominant part of the academic management, knowledge management also encompasses activities related to the selection and promotion of the academic staff, design of the education curricula for different study programs, transferring knowledge toward community or other universities through academic networks [66–68], and creating a culture of trust and knowledge sharing. Knowledge management should discover the professors’ tacit knowledge and find ways of stimulating them to share it [69,70]. Since many universities have nested age layers for their teaching staff, intergenerational knowledge sharing and learning becomes very important [71]. Although knowledge sharing should be one of the knowledge strategies implemented in universities, there is a strong dynamics between cooperation and competition between individuals as a result of the competitive pressure for publications, promotion, and winning research grants [69]. As Spender remarks, “At [the] bottom, knowledge management means managing the relationship between knowing and acting in organizational contexts, part of which is managing the processes of knowing and learning towards organizational ends” [72].

Based on the literature analysis, we can formulate the following hypotheses:

**Hypothesis 1 (H1).** *Academic management positively influences knowledge management.*

**Hypothesis 2 (H2).** *Academic management positively influences curriculum.*

**Hypothesis 3 (H3).** *Academic management positively influences the relationship with the business environment.*

## 2.2. Business Education

Business education design should start with a deep understanding of what a *business* is. One of the most accurate explanations about the nature and goal of business came from Drucker: “To know what a business is, we have to start with its *purpose*. Its purpose must lie outside of the business itself. In fact, it must lie in society since business enterprise is an organ of society. There is only one valid definition of business purpose: *to create a customer*” [73] (p. 61). That means to create products and services to satisfy the needs of people, or in a larger perspective, to create value for society as Branson underlines: “I happen to believe in business because I believe that business can be a force for good. By

that I mean *doing good is good for business*" [74] (p. 7). However, the needs of people and the consumers' behavior are changing, such that it is a real challenge to identify them in a changing world. Globalization and disruptive innovations contribute significantly to such changes [75–77]. These changes accelerate in time, especially after economic crises, such as the global and complex COVID-19 crisis [38,39].

The dramatic changes in the business environment induce changes in the job market, which is a phenomenon with direct implications on business education. Universities should prepare business students for "jobs that have not yet been created, for technologies that have not yet been invented, to solve problems that have not yet been anticipated. It will be a shared responsibility to seize opportunities and find solutions" [46] (p. 2). That is a difficult challenge for most of the actual business programs, which have curricula designed for a static or slow changeable and easily controllable business environment. According to Mintzberg, many conventional MBA programs offered by American and Canadian universities "train the wrong people in the wrong ways and with the wrong consequences" [78] (p. 6). These programs are based on linear combinations of courses and case studies and generally reflect a deterministic thinking. Considering the business environment dynamics and the uncertainty of its development, the business curricula should incorporate nonlinear and probabilistic thinking models [79–83]. As a former dean of the Rotman School of Management at the University of Toronto and a professor of strategic management, Roger Martin recommends incorporating into the business education curricula design-thinking and abductive logical models [84]. Tsang and Tsui [85] introduced the concept of Personal Learning and Network Environment (PLE&N) to create a knowledge ecosystem supported by advanced information technology applications. Tsui and Dragicicvic [86] continued that idea and "demonstrate that curriculum can be improved by co-creation inviting students, graduates, managers, and employers to work together with professors and academic leaders" [48] (p. 2).

The vision and mission statements of the leading American graduate business schools incorporate the idea of creating powerful mindsets for leaders capable of changing the world. That means to design curricula with an emphasis on knowledge management, change management, strategic thinking, innovation, ethics, and corporate governance [87–90]. "The solution lies in the principle of shared values, which involves creating economic value in a way that also creates value for society by addressing its needs and challenges. Business must reconnect company success with social progress" [91] (p. 64). The mission of creating business leaders capable of changing the world implies that business education should incorporate more experiential learning [20], emotional and spiritual knowledge, as well as emotional and spiritual intelligences [21,22,92].

### 2.3. Knowledge Management and Business Education

The literature focusing on the influence of knowledge management on business education is rather scarce. The explanation may come from the complexity of the topic and from inertial thinking in designing new models for business education curricula. The extant literature dealing with this interaction between knowledge management and business education is focusing on changing the paradigm of knowledge transfer from professors to students into a new one based on developing generic competences for the future business workers [45–49]. Developing generic or employability skills become more important than transferring and accumulating knowledge [47,93,94]. Based on a critical literature review, Bratianu, Hadad, and Bejinaru define a competence as "a dynamic integration of knowledge, skills, and attitude capable of performing a generic task, in a given context, at a certain quality level" [48] (p. 5).

Business education needs inputs from the business environment [86,88,95,96], and because of this interaction, we have to enlarge the learning environment from the university campus to a knowledge ecosystem and to consider the synergy of rational, emotional, and spiritual knowledge, or that of explicit knowledge obtained in the university with tacit knowledge generated within the business environment [3,20,78]. Thus, the interaction

between knowledge management and business education is a complex process that is mediated by the academic curriculum for delivering rational knowledge and developing generic thinking skills, and by the business environment for creating tacit knowledge through experiential learning, generic skills for teamwork and leadership, and specific attitudes for entrepreneurship and business enterprise.

Based on the literature analysis, we can formulate the following hypotheses:

**Hypothesis 4 (H4).** *Knowledge management influences business education.*

**Hypothesis 5 (H5).** *Knowledge management influences curriculum positively.*

**Hypothesis 6 (H6).** *Knowledge management positively influences the relationship with the business environment.*

**Hypothesis 7 (H7).** *Curriculum positively influences business education.*

**Hypothesis 8 (H8).** *Business environment positively influences business education.*

### 3. Materials and Methods

#### 3.1. The Research Model

Based on the literature analysis, we defined the following constructs: academic management (AM), knowledge management (KM), curriculum (C), business environment (BE), and business education (BED). The correlations between these constructs are shown in Figure 2. Although these correlations are presented by straight lines, the phenomena they illustrate are nonlinear and complex in their manifestation. AM is an independent variable because in the university context, academic management is the driving force of all the other variables. KM is a dependent variable because knowledge management is incorporated in the academic management, and BED is a dependent variable because it is a resultant of all the other variables' behavior. C and BE have a mediating effect because the explored phenomena are complex and cannot be reduced to a single linear and direct correlation between knowledge management and business education.

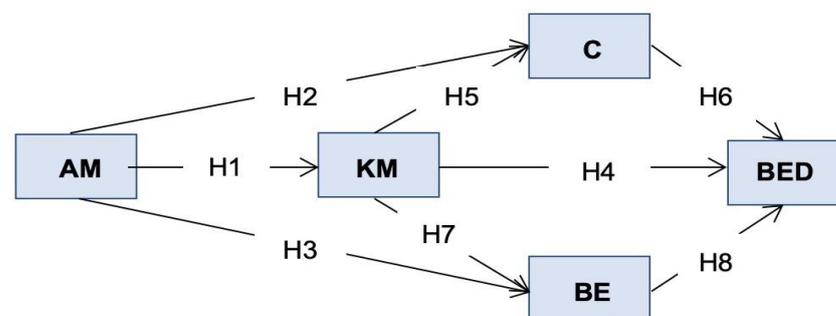


Figure 2. The research model.

This conceptual research model should be interpreted as a dynamic model and our analysis as an evaluation of a complex phenomenon at a given time for a given external business environment. That evaluation is based on students and professors' perception engaged in undergraduate and graduate programs of business and management from two universities from Romania.

#### 3.2. Sample and Data Collection

A questionnaire-based survey was conducted between November and December 2020 among students and academics from business and management programs from the National University of Political Studies and Public Administration and Bucharest University of Economic Studies, Romania. The questionnaire was designed to reach mainly students in the graduation year of bachelor programs, students in master and doctoral programs, and university professors. The age of participants ranges from 19 to 65 years

( $M = 25.50$ ,  $SD = 9.13$ ). The composition of participants based on their education level is presented in Table 1. For data collection, a purposive convenience sampling technique was used.

**Table 1.** Sample distribution according to educational level.

n = 236	Frequency	Percent
Bachelor	111	47
Master	97	41.1
Doctorate	13	5.5
Professors	15	6.4

Both universities experience a high level of students' employability, especially those in the final years of graduate programs. In addition, most of the graduate students are already employed in national and multinational companies. From the whole sample used in the present research, 42% of the respondents are already active in the labor market. Thus, the influence of the business environment could be felt in the statistical analysis. A self-reported data collection technique was used. Before completion, the purpose of the study was briefly explained to the participants, and informed consent was obtained. All participants were ensured about the confidentiality of the data and that it would be only for research purposes.

### 3.3. Measures

To collect relevant data, five sets of measures were developed aiming at measuring each of the five constructs of the research model (i.e., AM, KM, C, BE, and BED). The initial versions of the scales were tested using a sample of 109 participants. After a throughout analysis of each item's contribution to the scale reliability, the final version of the questionnaire was decided. As shown in Table 2, the internal consistency coefficients analysis was performed for all the research model variables by computing the Cronbach's alpha. The results were higher than the recommended value of 0.7 [97,98], which indicates that the reliability of the variables was acceptable. For all five scales, the ratings were provided using a 5-point Likert-type scale (1 = strongly disagree, to 5 = strongly agree). The Cronbach's alpha values are presented in Table 2.

**Table 2.** Reliability statistics.

Scale Name	N of Items	Cronbach's Alpha
Academic Management (AM)	6	0.889
Knowledge Management (KM)	6	0.887
Curriculum (C)	6	0.905
Business Environment (BE)	6	0.894
Business Education (BED)	6	0.910

The AM was assessed by summing over respondents' ratings on the different actions and behaviors that the university employs, such as, "The university reacts quickly to changes in the external environment" and "There are ERASMUS programs for students and professors". For the KM, the items used were focused on knowledge processes, such as, "Students have access to databases with scientific articles" and "We are stimulated to share our knowledge and experience".

To assess the flexibility and adaptability of the C, respondents were asked to rate items such as, "The structure of curriculum is reviewed annually and it is adapted to the new requirements of the business environment" and "The content of the courses is reviewed annually and adapted to the new requirements of the business environment". The BE

scale contains items such as, “Successful entrepreneurs and business people are invited to give lectures to students and to share their professional experience” and “The business environment offers students internship opportunities”. For the BED construct, the items used focused on their generic skills and knowledge competencies, such as, “Students benefit from up-to-date theoretical knowledge about the business environment” and “Students develop entrepreneurial skills”.

#### 4. Results

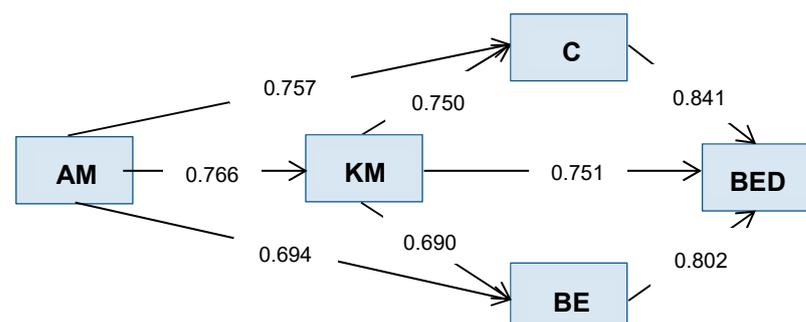
After collection, the data were analyzed using SPSS 26.0 version software, including the PROCESS macro for SPSS version 3.5 developed by Andrew Hayes [99]. Finally, we carried out a Sobel test (<http://quantpsy.org/sobel/sobel.htm>, accessed on 10 January 2021) to probe the mediation effect [100]. The analysis of skewness and kurtosis measures shows that their values fall in the acceptable range for the distribution of data. Table 3 presents some descriptive statistics.

**Table 3.** Descriptive statistics.

	N	M	SD	Skewness	Kurtosis
Academic Management (AM)	236	4.06	0.73	−0.765	−0.033
Knowledge Management (KM)	236	3.74	0.82	−0.483	−0.210
Curriculum (C)	236	3.81	0.85	−0.670	−0.071
Business Environment (BE)	236	3.97	0.83	−0.813	−0.017
Business Education (BED)	236	3.86	0.91	−0.702	−0.123

To identify the statistical significance of the proposed measures, the data were analyzed for mean scores and standard deviation. The findings indicate that academic management practices and academic knowledge responsiveness (i.e., the quick reaction to changes in the external business environment, creating recognized and tailored competencies for students, stronger partnerships with the business environment, and student exchange programs) are the most important activities for the university. The highest values are for AM (M = 4.06, SD = 0.73), BE (M = 3.97, SD = 0.83), and BED (M = 3.86, SD = 0.91). The statistical results for the research model correlations are presented in Figure 2. A Pearson product–moment correlation technique was used, and it confirms that all five constructs are positively associated with one another.

These statistical results demonstrate that all the initial hypotheses are validated. From the analysis of the data presented in Figure 3, it is shown that C followed by BE have the most important direct influences upon BED, indicating their role as mediators for KM. In addition, we may observe a synergy effect of AM and KM in designing C. We may observe a similar but smaller effect for the influence of AM and KM on the role of BE in business education. All of these results show that academic management and knowledge management are powerful nonlinear integrators for a university [101].



**Figure 3.** Statistical results for correlations.

In order to test the mediation model [102], the PROCESS macro for SPSS version 3.5 was used [97]. The first mediation process contains KM as a predictor, C as a mediator, and BED as an outcome variable (see Figure 2). The process shows that a change in the predictor variable (KM) leads to a change in the mediator (C), and that change leads to a change in the outcome variable (BED). The statistical results related to this mediation process highlights the full mediation effect on BED: KM → C → BED. Numerical results are presented in Table 4.

**Table 4.** Regression results for the first process of mediation.

Model	Coeff.	SE	t	p	CI (Lower)	CI (Upper)
Without mediator						
KM → BED (c)	0.8400	0.0482	17.412	0.0000	0.7449	0.9350
With mediator						
KM → C (a)	0.7766	0.0447	17.355	0.0000	0.6884	0.8647
C → BED (b)	0.6848	0.0546	12.553	0.0000	0.5774	0.7923
KM → BED (c')	0.3082	0.0565	5.457	0.0000	0.1969	0.4194

In Step 1 of the mediation model, the regression of the knowledge management of business education, ignoring the mediator, is significant,  $F(234) = 303.19$ ,  $p < 0.01$ ,  $R^2 = 0.56$ ,  $b = 0.84$ ,  $t(234) = 17.41$ ,  $p < 0.01$ . Step 2 shows that the regression of the knowledge management on the mediator, Curriculum, is also significant,  $F(234) = 301.22$ ,  $p < 0.01$ ,  $R^2 = 0.56$ ,  $b = 0.77$ ,  $t(234) = 17.35$ ,  $p < 0.01$ . Step 3 of the mediation process shows that the mediator, curriculum, controlling for knowledge management is significant,  $F(233) = 331.84$ ,  $R^2 = 0.74$ ,  $p < 0.01$ ,  $b = 0.68$ ,  $t(233) = 12.55$ ,  $p < 0.01$ . Step 4 of the analysis reveals that controlling for the mediator, curriculum, knowledge management score is a less significant predictor of business education,  $b = 0.30$ ,  $t(233) = 5.47$ ,  $p < 0.01$  than in the previous case.

As suggested by Baron and Kenny [103], the Aroian version of the Sobel test was conducted, and it was found that curriculum mediated the relationship between knowledge management and the business education ( $z = 10.15$ ,  $p = 0.00$ ). The same results were obtained for the Goodman version of the Sobel test ( $z = 10.18$ ,  $p = 0.00$ ). For both tests, the standard error  $SE = 0.05$ .

In order to test the second mediation model, the same PROCESS macro for SPSS was used. In this regression analysis, knowledge management is the predictor, business environment is the mediator, and business education is the outcome variable (see Figure 2). The mediation causality indicates that a change in the predictor leads to a change in the construct of the business environment, which leads then to a change in the construct of business education. The regression results are shown in Table 5.

**Table 5.** Regression results for the second process of mediation.

Model	Coeff.	SE	t	p	CI (Lower)	CI (Upper)
Without mediator						
KM → BED (c)	0.8400	0.0482	17.412	0.0000	0.7449	0.9350
With mediator						
KM → BE (a)	0.7039	0.0482	14.593	0.0000	0.6089	0.7989
BE → BED (b)	0.5941	0.0527	11.270	0.0000	0.4902	0.6979
KM → BED (c')	0.4218	0.0537	7.847	0.0000	0.3159	0.5277

In step 1 of the mediation model, the regression of the knowledge management on the business education, ignoring the mediator, is significant,  $F(234) = 303.19$ ,  $p < 0.01$ ,  $R^2 = 0.56$ ,  $b = 0.84$ ,  $t(34) = 17.41$ ,  $p < 0.01$ . Step 2 shows that the regression of the knowledge

management on the mediator, business environment, is also significant,  $F(234) = 212.97$ ,  $p < 0.01$ ,  $R^2 = 0.47$ ,  $b = 0.70$ ,  $t(234) = 14.59$ ,  $p < 0.01$ . Step 3 of the mediation process shows that the mediator, business environment, controlling for knowledge management, is significant,  $F(233) = 296.76$ ,  $R^2 = 0.71$ ,  $p < 0.01$ ,  $b = 0.59$ ,  $t(233) = 11.27$ ,  $p < 0.01$ . Step 4 of the analysis reveals that controlling for the mediator score is a less significant predictor of business education,  $b = 0.42$ ,  $t(233) = 7.84$ ,  $p < 0.01$  than in the previous case.

As suggested by Baron and Kenny [103], the Aroian version of the Sobel test was conducted, and it was found that business environment mediated the relationship between knowledge management and business education ( $z = 8.91$ ,  $p = 0.00$ ).

After a complete analysis (descriptive, correlations, PROCESS mediation, regression, and finally the Sobel test) of the obtained data from the 236 completed questionnaires, the results allow the discussions on the empirical evidence for the proposed research questions, which confirm that KM has a strong impact on business education through the mediation of the C variable. In the same regard, KM activities have a significant influence on BED through BE; the results indicate that interactions between specialists, the development of international exchange programs, partnerships with the business environment, and involvement in redesigning the academic curricula would increase the likelihood of collaboration with the business environment that ultimately contributes to the performance of the university and student outcome. Furthermore, the results have validated the relationship between knowledge management (KM), curriculum (C), and business environment (BE) as a continuous process of integrating market needs and requirements into the holistic perspective of business education.

## 5. Discussion

The present research shows that knowledge management influences directly and through the mediation affects business education, and from this point of view, it integrates in the larger perspective of learning how knowledge management contributes to the performance of universities and of their academic programs [104,105]. Based on the above results, it could be stated that knowledge management, as an integrated part of the academic management, has a significant impact on organizational processes related to both academic curriculum and integration of the business environment through different collaborations into university life. Knowledge management is a powerful nonlinear integrator for business education [101].

The data for correlations and reliability shown in Figure 3 and Table 2, respectively, demonstrate a solid internal consistency yielding a Cronbach's alpha of 0.889 and a significant correlation coefficient of  $r = 0.776$ , giving a positive answer to the research question RQ1. Statistical results of the proposed model strongly support the relationships among all five variables. However, the highest value for the Cronbach's alpha (i.e., 0.910) and the strongest correlation coefficient (i.e.,  $r = 0.841$ ) show that knowledge management (KM) influences positively business education (BED) through the mediation of academic curriculum (C) and business environment (BE) variables. These results, or part of them, are supported by several studies [88,106,107]. In addition, these correlations show the need for creating a new learning environment for students [85,86], using new teaching styles, and switching from a transfer of knowledge from professors to students, to developing generic skills and competencies [48,108].

The added value of the present paper comes from the design of the research model that introduces knowledge management as a pivotal construct in the correlations between academic management and the business education, and by considering curriculum and business environment as mediator factors. The mediation effect shows that these correlations are not linear and that the whole process of business education can be open toward knowledge flows coming from the business environment.

In a larger perspective, the present research reveals the need for developing metrics suitable for the evaluation of the knowledge management effectiveness. "Knowledge management metrics must describe how an organization uses knowledge in all of its business functions and processes, how it supports knowledge management functions, and

how it manages its knowledge assets" [109] (p. xii). Similar ideas can be found in the works of Wen [110] and Wu, Ong, and Hsu [111].

The present research suggests a series of concrete actions that can be taken at the university level. The main action would be to designate one of the vice-rectors as in charge of the knowledge management system. That will lead to a systematic approach to all necessary actions to stimulate intergenerational learning, to integrate the information technology much better into the teaching and learning process of students, to intensify the knowledge flows between university and the business environment, and to contribute directly to adapting continuously the academic curriculum to the needs of students. Through the knowledge management system, the university can increase its contribution to the triple helix dynamics and create necessary conditions for business sustainability.

## 6. Conclusions and Research Limitation

The present research aims at exploring the impact of knowledge management on business education, considering five basic constructs: academic management (AM), knowledge management (KM), curriculum (C), business environment (BE), and business education. Knowledge management is conceived as an integral part of academic management, although its role in a knowledge-intensive organization becomes dominant. Curriculum and business environment are considered as mediators because knowledge management cannot act directly on the content of business education.

The structure and the functionality of the proposed research model have been decided based on a critical literature review, as well as the own experience of the authors in academic life. The quantitative research is based on a survey performed among students and professors involved in the third year of undergraduate programs as well as master-level and doctoral-level business and management programs from two Romanian universities. The statistical analysis has been performed by using SPSS version 26.0, including the PROCESS macro for SPSS version 3.5. The data obtained for correlations among all the five constructs demonstrate a very good level of reliability and functionality. In addition, the data show the importance of curriculum and business environment in mediating the influence of academic management and knowledge management on business education. This conclusion has practical implications in designing the students' learning environment based on the needs of the changing business environment. In a larger perspective, the present research shows the importance of organizational learning processes in transforming universities in learning organizations.

The present research has some limitations imposed by the selection of the sample and by the complexity of the whole process of business education. The sample of participants can be extended in further analyses to more universities, enlarging the number of professors, and by including respondents from the business environment. A limitation coming from the complexity of the whole business education process consists of ignoring the organizational culture from the conceptual research model, which is a factor that may have a moderating role.

Current research can be continued by exploring other potential mediator or moderator variables on the effects of KM on BED (e.g., innovation, psychological empowerment, transformational leadership) and by using mixed methods and longitudinal studies to better explore the causal relationships between the selected variables.

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