Journal of Management and Business Education

JMBE

www.journaljmbe.com ISSN: 2605-1044 Published by Academia Europea de Dirección y Economía de la Empresa.

Why learning style versatility matters in management and business education: Linking the concept to learning outcomes

Por qué la versatilidad en los estilos de aprendizaje es importante en la educación empresarial y de gestión: Vinculación del concepto con los resultados de aprendizaje

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Amann, W. (2026). Why learning style versatility matters in management and business education: Linking the concept to learning outcomes. *Journal of Management and Business Education*, *9*(2), 302-321. https://doi.org/10.35564/jmbe.2026.0016
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Language: English
Received: 22 May 2025 / Accepted: 06 Jul 2026

Funding. The author received no financial support for the research, authorship, and/or publication of this article.
Ethics Statement. The author confirms that data collection for the research was conducted anonymously, and there was no possibility of identifying the participants. The author equally confirms that the research obtained informed consent from participants, explaining the treatment of the provided data.
Declaration of conflicting interests. The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.
CRediT author statement. The author was solely responsible for all aspects of the work.
AI Statement. AI in the form of Grammarly.com has only been used to carry out a final language editing check.

ABSTRACT

Business schools are facing growing criticism for their outdated structures and insufficient attention to relevance, ethics, and learner individuality. Against this backdrop, this study aims to introduce the concept of learning style versatility (LSV) – a learner's capacity to flexibly apply multiple learning styles – to examine its role in shaping educational outcomes. Using a survey of 120 undergraduate and graduate business students at a private business school in India, this study operationalises a novel LSV proxy based on the Honey and Mumford Learning Style Questionnaire and tests its relationship with learning performance. Regression analysis shows that higher LSV is significantly associated with improved cumulative grade averages. The analysis controls for age, gender, and program level in the multivariate regression. However, LSV does not predict subjective outcomes such as learner satisfaction or perceived return on investment, underscoring the multidimensionality of "learning success." This study provides the first empirical evidence of LSV's

impact on academic performance, positioning versatility as a crucial learner characteristic in volatile, uncertain, complex, and ambiguous (VUCA) environments. The study's findings suggest that integrating LSV into management education can enhance both teaching and institutional effectiveness in the highly competitive Indian MBA market, while simultaneously respecting learner individuality more than is currently the case. The article concludes with directions for future research to advance an ergo-ecology of learning.

Keywords. Learning styles, learning style versatility, business schools, management education.

RESUMEN

Las escuelas de negocios se enfrentan a críticas crecientes debido a la obsolescencia de sus estructuras y a la insuficiente atención prestada a la relevancia de la formación, la ética y la individualidad del alumnado. En este contexto, el presente estudio introduce el concepto de versatilidad en los estilos de aprendizaje (VEA), entendido como la capacidad del estudiante para aplicar de manera flexible diferentes estilos de aprendizaje, con el propósito de analizar su influencia en los resultados educativos. A partir de una encuesta realizada a 120 estudiantes de grado y posgrado de una escuela de negocios privada de la India, el estudio operacionaliza una nueva medida aproximada de la VEA basada en el Cuestionario de Estilos de Aprendizaje de Honey y Mumford, y examina su relación con el rendimiento académico. Los resultados del análisis de regresión muestran que una mayor VEA se asocia significativamente con una mejora del promedio acumulado de calificaciones. El análisis de regresión multivariante controla los efectos de la edad, el género y el nivel del programa académico. Sin embargo, la VEA no permite predecir resultados subjetivos, como la satisfacción del alumnado o el retorno de la inversión percibido, lo que pone de manifiesto el carácter multidimensional del «éxito en el aprendizaje». Este estudio aporta la primera evidencia empírica sobre la influencia de la VEA en el rendimiento académico y sitúa la versatilidad como una característica fundamental del alumnado en entornos volátiles, inciertos, complejos y ambiguos (VUCA). Los resultados sugieren que la integración de la VEA en la educación empresarial y de gestión puede mejorar tanto la eficacia docente como la institucional en el altamente competitivo mercado indio de los programas MBA, al tiempo que permite respetar en mayor medida la individualidad del alumnado. El artículo concluye planteando futuras líneas de investigación orientadas a avanzar en el desarrollo de una ergoecología del aprendizaje.

***Palabras clave**. Estilos de aprendizaje, versatilidad en los estilos de aprendizaje, escuelas de negocios, educación empresarial y de gestión.*

INTRODUCTION

Understanding how business schools evolve to help cope with ever more demanding business environments

This study takes place in the larger, ever more demanding business school context. Two trends seem to warrant special attention and solutions. Firstly, it aligns with the insight that business school graduates must navigate increasingly volatile, uncertain, complex, and ambiguous (VUCA) business environments, as detailed by Betof et al. (2014), Codreanu (2016), and Fassinger et al. (2017). Assuming this is true, the study must consider a business environment that requires leaders to adopt a lifelong learning approach to managing these complex conditions. Thus, we view leaders as learners in such a VUCA environment (Mikkelsen & Jarche, 2015). In line with these authors, this study assumes that future leaders and managers can benefit from understanding how they learn best, thereby better preparing them for the demands ahead. Therefore, learning abilities in a

broader sense can offer a promising avenue for future research. It can be a powerful solution to the dilemma imposed by demanding business environments.

Secondly, this study addresses how business schools evolve and could potentially evolve further to create value. According to Lorange (2012), business schools must innovate and overcome outdated structures. There is fierce competition for them to improve their position in terms of rigour and relevance and to differentiate themselves from others (Fragueiro & Thomas, 2011). However, suppose faculty members are caught up in a publish-or-perish framework that determines their selection, promotion and retention as staff members. This can inhibit their creativity in selecting and delivering classroom content (Smeyers et al., 2014) or innovating their schools. This becomes more challenging and complex as learning demands increase. Today's learning has to be multi-levelled to include elements pointed out by Thaker (2015) on (1) the level of knowing (knowledge, models and facts), (2) the level of doing (actual problem-solving skills), (3) the level of being (clarifying which values count), and (4) the level of becoming (key development stages over time). Business schools thus need to retain learning as a meta-responsibility within their comprehensive focus and should continually review which aspects of their programs they can improve.

The research presented in this study addresses the question: What is the impact of LSV on learning outcomes? It is a central piece of the puzzle for understanding learners in business schools in sufficient depth to meet the increasing demands of the VUCA world innovatively. The study moves beyond the frequently encountered discussions of learning styles (LS) to introduce the concept of 'LSV'. It provides original empirical support for LSV's relevance to improving understanding of learning processes and, subsequently, optimising learning outcomes.

Structure of the analysis

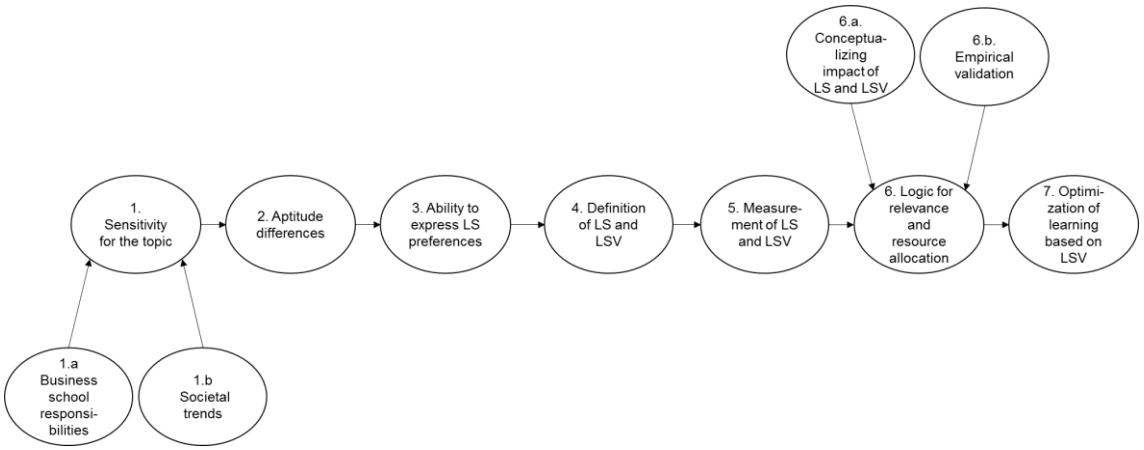
The analysis continues with an in-depth review of the key constructs in the literature. A nomological net helps to visually situate the focal concept, LSV, within a broader context and network of related constructs. It prevents the concept from being treated in isolation by clarifying how it is similar to or different from existing constructs, which dimensions require clarification to fully comprehend it, and what is already known about it and what is not. This adds conceptual precision and avoids the common critique that new constructs are "just relabeling" old ones. The literature review culminates in the emerging conceptual framework on the central hypothesis.

The subsequent methodology section outlines the chosen quantitative approach, which relies on survey data as the basis for the regression analysis. It presents the new proxy for measuring LSV. Subsequent results and discussion sections present and critically review findings before concluding.

LITERATURE REVIEW

Repeated cycles of divergence (searching for additional papers) and convergence (distilling the most relevant aspects of ongoing debates) shaped the process. This distillation produced a map of key themes, visualised in Figure 1 through a nomological approach (Ziegler et al., 2013). The figure provides the organising structure for the following literature review. First, it clarifies the rationale for engaging with the topic. Second, it highlights differences in aptitude and learner individuality. Third, it examines learners' ability to articulate preferences explicitly. Fourth, it introduces definitions of LS and LSV. Fifth, it surveys methods of measuring LS and LSV. Sixth, it reviews the literature on resource allocation. Finally, it discusses how optimised learning can be understood from an LSV perspective, thus rounding out the review.

Figure 1. Nomological approach to the field of LSV and structure of the literature review



Source: Own elaboration.

Topic 1a: Attention to individuality as an ethical responsibility

The importance of learning styles can be understood through an ethical lens. All three elements of ethical consideration – value, process, and outcome – are applicable in this context. Various studies, for example, those by Kosower and Berman (1996), confirm the existence of different learning styles. The question that emerges is whether, from a value perspective, the individuality and uniqueness of learning styles should be respected or ignored. Faculty and course directors need to consider whether, in the process of curriculum development and teaching, they should leverage (or ignore) individual learning styles, as suggested and illustrated by Labib et al. (2017). From an outcome perspective, they need to consider whether it matters how institutions reach their targets, as indicated by Wieland et al. (2018).

Topic 1b: Societal trends

Pashler et al. (2008) link the growing academic interest in learning styles to institutions' extensive marketing efforts associated with the commercialisation of learning-style measurement. Self-esteem discussions (Twenge, 2006) that were en vogue when the learning style concept started to gain traction, catalysed the development of learning style instruments. Consequently, proprietary commercial tools, certification programs, and accompanying literature emerged. These authors are not the only ones criticising the commercialisation of learning and development initiatives. Actual empirical tests in the learning styles research field have been weak, if not contradictory (see, for example, Kellerman, 2012), indicating that further conceptual and empirical work could yield additional insights. Moving beyond LS and embracing LSV could be the next step in advancing the field, which has gained momentum over time. A convergent trend is to inquire about the real value created by business schools. Lorange (2023) calls for a more revolutionary and not merely evolutionary approach to business and management education. Value and impact must become more pronounced. In this context, graduates becoming better learners represents a promising avenue forward.

Topics 2 and 3: Aptitude differences and ability to express learning style preferences

The tools available for student learning support might not recognise learning complexity nor depict it holistically when scholars attempt to conceptualise and operationalise learning. Learning theories are extremely rich and, at times, complicated. Definitions of 'learning' range from focusing on an increase in knowledge to concentrating on the social settings of knowledge creation. The

latter contrasts with a transmission model of learning (Cox, 2017). Other definitions of learning style view the aim of gaining knowledge as insufficient or less relevant and prefer to emphasise “an increase, through experience, of problem-solving ability” (Washburne, 1936, p. 611). Thus, there are fragmented theoretical foundations, and the assumption that people fit into distinct boxes regarding how they learn best is partly confirmed and perpetuated, even in very recent studies (Hattie & O’Leary, 2025), but is never critically questioned or upgraded toward a more versatile view.

This study offers a new perspective, one that has started to enrich the field of leadership. This study proposes that the learning style debate should be revisited, expanded, reframed, and reconceptualised from a perspective of versatility, rather than a simplistic categorisation perspective. Amann (2025) made an initial attempt by focusing on faculty perspectives and readiness to develop learning-style versatility. No actual quantitative confirmation or hypothesis testing has been published in article form as of yet.

Topic 4: Definitions of learning styles and LSV

There is a need to clarify the terms "learning styles" and the emerging construct of LSV. For Rolfe and Cheek (2012), the term learning style “refers to the concept that individuals differ in regard to what mode of instruction or study is most effective for them (p. 105). Such a definition is ambiguous as to whether it refers to knowledge development or problem-solving abilities. Alternatively, El-Saftawy et al. (2024) and Chinnapun et al. (2024) continue a tradition of relying on a senses-oriented differentiation of learning modes, such as auditory or visual modes, previously suggested by Fleming and Mills (1992). Curry (1981) focused on behaviour, and views learning styles in a multidimensional way as well and as the “characteristic cognitive, effective, and psychosocial behaviours that serve as relatively stable indicators of how learners perceive, interact with, and respond to the learning environment” (p. 535) without specifying whether learning styles should focus on mere knowledge gains or on more aspects of learning.

In addition, if a process view on learning is essential, some definitions are narrower and some broader. Hayes and Allinson (1993) define a learning style as a person’s preference for a distinct way of processing new information and organising a learnt insight or piece of information. More recently, Bazán-Perkins and Santibañez-Salgado (2025) clarify that learning style preferences concern how students acquire, understand, interpret, organise, and process information from their courses, thereby perpetuating a more learning-subject-neutral stance. As Hattie et al. (2025) illustrate, it is not only about learners’ preferences but also about faculty members’ beliefs in what works. Similarly, Whetten and Cameron (2002) not only include data processing in their understanding of learning styles but also emphasise the information-gathering phase and the phase in which individuals act on the information received. Regarding the quiddity of learning styles, Claxton and Ralston (1978) emphasise that a person’s learning style should be defined as something constant. Amongst others, Amiri et al. (2024) extend research on learning styles to digital learning. The authors outline the unique advantages of acknowledging learner preferences by customising learning journeys in e-learning.

A review of the literature revealed a major gap in past studies: they overemphasise individual learning styles while neglecting LSV. Research has not yet advanced to the next possible level because parallels to other fields and how constructs mature over time have not been drawn. Past studies have largely focused on identifying which styles exist and when a particular style might be more conducive to good learning outcomes. Learning outcomes are typically defined as explicit statements of what a learner is expected to know, understand, or be able to do after a learning process (Biggs & Tang, 2011). They provide measurable goals that align teaching methods, assessments, and curricula. Bloom’s taxonomy (Bloom et al., 1956) and its later revisions (Anderson & Krathwohl, 2001) remain foundational. They classify outcomes into cognitive (knowledge), affective (attitudes), and psychomotor (skills) domains. These taxonomies emphasise

a hierarchy of complexity, from remembering to creating. Kirkpatrick (1976) proposed a similar progression of complexity when measuring learning outcomes, with the latest conceptual updates integrating more contextual,) process, and causal aspects (cf. Kirkpatrick & Kirkpatrick, 2016).

In this context, Biggs (1996) introduced the concept of constructive alignment, which ties together intended learning outcomes, teaching/learning activities, and assessment. The idea is that teaching should be designed backwards from outcomes, ensuring alignment to achieve the learning outcomes as suggested by Bloom et al. (1956) or Anderson and Krathwohl (2001). According to Harden (2002), and particularly in higher education and professional schools, outcomes are framed in terms of competencies (knowledge, skills, and attitudes) rather than solely cognitive goals. This is in line with Sadler (2007), who calls for learning outcomes to be measured using performance-based assessments. However, some scholars critique rigid outcome frameworks for reducing learning to checklists or standardised tests, arguing instead for flexible and contextualised outcomes that adapt to learners' needs and environments (Hussey & Smith, 2008). In sum, the literature describes several alternatives to view LS. The multidimensionality of learning is clearly acknowledged.

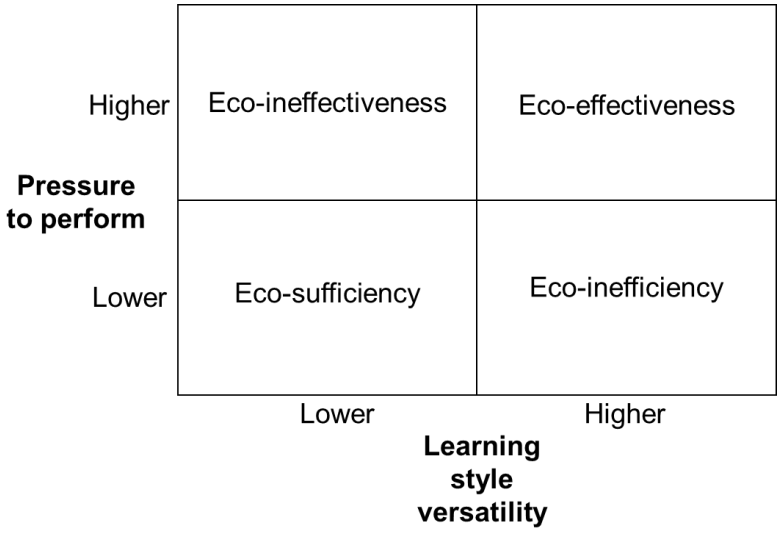
Topic 5: Measuring learning styles and LSV

Business schools have often been criticised for focusing on shareholder value, their one-dimensional understanding of performance, and for training graduates to be more efficient and effective. In contrast, they do not focus sufficiently on sustainability with a triple-bottom-line approach (i.e., by simultaneously fostering financial, environmental, and social sustainability) or human dignity (Amann et al., 2011). The criticism is that these schools pay little attention to the learner's individuality, i.e., they do not attend to the 'being' and 'becoming' levels of learning. In the past, Bennet (1995) remarked that 'learning styles' is an idea that needs to be better understood. Studies followed, and the idea of exploring learning styles to optimise learning experience has spread internationally across diverse countries in (e.g.) North and South America, Europe and Asia (Milgram et al., 1993). Yet, the field of learning styles has not escaped criticism, as the following points will illustrate. Clinton-Lisell et al. (2024) provide evidence that this is not merely a neuromyth, as the meshing hypothesis has substance. Certain learning styles are associated with better learning progress (Mohsenipouya et al., 2024). Adapting instruction to learning styles yields better outcomes across numerous experiments (Erdem & Kaf, 2023).

Conceptual framework

LSV represents a new perspective in the fields of business school development and learning. It responds to a call for an orientation towards more human dignity in business science education. The concept has greater potential than 'learning style' to offer innovative, unique value to the learner and other stakeholders; thus, it addresses items 6 and 7 in the nomological net presented above. It is based on the logic and emerging conceptual framework described here. Figure 2 provides a visual representation of this study's conceptual framework, differentiating four cases that together form the foundation of a learning-style ergo-ecology view. In more general terms, according to García-Acosta et al. (2014), ergo-ecology aims "to provide tools for confronting twenty-first-century challenges" (p. 111). It is multidisciplinary and emphasises human aspects in interaction with its ecosystem. More precisely, as understood in this study, it embeds the ergonomics of LSV within its ecosystem, allowing us to differentiate four scenarios, each exhibiting varying degrees of fit, efficiency, and effectiveness.

Figure 2. Conceptual framework of the analysis



Source: Own elaboration.

The bottom-left quadrant has been labelled eco-sufficiency. Limited LSV suffices when learners encounter learning challenges that are neither overly simplistic nor overly complicated or complex. Such a learning constellation is eco-sufficient. Fostering higher versatility levels, e.g., by attracting higher quality students through sign-up bonuses or scholarships, can raise expectations of returns on education in terms of time, energy, and possibly financial terms. The learner in this system is sufficiently equipped to handle the situations they encounter. The top-left quadrant refers to a case in which the learner's limited LSV does not meet the diversity of learning challenges and stimuli provided. The learner might find some of the learning interventions, such as exercises, role play, or stakeholder dialoguing, odd, as (e.g.) in the case of a pronounced theorist who is not an activist. Designing a tremendously rich learning journey (top-left corner) would overwhelm a limited learner. Because the school's resources are not allocated effectively, the offer cannot be accepted; thus, the learning system is ineffective. It easily overwhelms the learner. Although this case represents a school that invests in rich learning experiences, the emotional reaction among a limited number of learners may be negative.

At the current stage of the analysis, this assumes a constant LSV and not a dynamic absorptive capacity. The literature suggests that the human brain exhibits varying degrees of plasticity in learning contexts (Ebernacer et al., 2015). The bottom-right quadrant represents a similar kind of inadequacy. A highly versatile learner with diverse learning preferences might find a one-dimensional teaching strategy too limiting and will question a faculty member's andragogic skills. The system is eco-inefficient because the learner's ability, or their versatility, is underutilised and thus wasted. The learner might feel that their skills and resources are not adequately considered. This could lead to disengagement and negative evaluations of the study program's efficacy.

The top right quadrant represents an ideal scenario among the possible situations. All resources, including the versatile learner and a capable surrounding ecosystem, are matched and fully utilised in this eco-effective situation. The learner encounters a program with a heterogeneous faculty and rich, divergent teaching strategies. Such a program might entail Excel-based financial modelling in finance classes, lectures in other courses, a service project in a sustainability course, hands-on communication training, and, alternatively, a reflection-based business philosophy course coupled with a professional thesis in which, after a literature review that identifies research gaps, data has to be gathered for finding answers to specific research questions. To work towards an initial and partial empirical test of the conceptualised program, the following hypothesis

emerges. For simplicity reasons, it assumes that the learning environment is more or less the same for all program participants.

H1: In a given learning environment, the higher the LSV, the higher the student's cumulative grade average.

Concluding the literature review, the main theories this study aspires to contribute to are highlighted. First, it represents a specific application of contingency theory to classroom learning in business schools. Donaldson (2001) calls for a fit between organisations and individuals with their environment. This aligns with Ashby's (2011) requisite variety principle, which posits that external complexity must be matched internally. Second, within the existing body of learning style theory, this study is the first to explicitly evolve LS to LSV, define it, grant it a central position conceptually as well as empirically, place it within a conceptual framework outlined above, operationalise it (as outlined in the following methodology section), and test empirically if it matters or not. As the discussion section below outlines, the field of LSV can develop in a manner similar to that of leadership style versatility. Therefore, there are several innovations.

METHODOLOGY

This section addresses the research philosophy, study participants, and the analytical framework, including specifications of variable operationalisation. The independent and dependent variables were operationalised.

Research philosophical orientation – ontology and epistemology

This study is grounded in a positivist research philosophy and adopts a quantitative research design (Cohen et al., 2007). Ontologically, it assumes that the focal constructs, most notably learning style versatility, academic performance, and selected demographic characteristics, exist as objective features of the social world that can be identified, operationalised, and measured independently of the researcher. Epistemologically, the study assumes that valid knowledge about these constructs can be generated through systematic observation, standardised measurement, and statistical testing of hypothesised relationships. In this view, theory guides the derivation of hypotheses, survey data provide empirical indicators of latent constructs, and regression analysis is used to assess whether observable associations support the proposed explanatory model. Accordingly, the study fits a positivist tradition in which reality is treated as measurable, researcher detachment is valued, and explanation is pursued through empirical regularities derived from numerical data (cf. Creswell & Creswell, 2018).

Study participants and data collection

A private business school in Bangalore, India, was chosen as a cooperation partner for this study. Its name is omitted in this description to ensure anonymity. India represents an interesting study ground for learning innovations, as it has the largest number of business schools in the world. Roughly one-third of the 17,000 business degree-awarding institutions worldwide are located in India. Innovations can be easily scaled up elsewhere, benefiting a larger audience and community. The institution was chosen because it was the first to respond, expressing interest in cooperating on this study after a larger number of schools were approached.

All 99 undergraduate students enrolled in the Bachelor of Business Administration (BBA) and all 107 Master of Business Administration (MBA) students were invited to participate in the survey. The study was conducted via an online survey. This modern, time-saving, environmentally friendly method minimises mistakes that could otherwise occur when data is entered manually from completed surveys. Participation was voluntary, and implementation adhered to the principle of

informed consent (Christians, 2000), reminding participants that they could withdraw from the study at any time without providing reasons or facing consequences. Data analysis was conducted after anonymisation, in accordance with best-practice guidelines for learning-style-related research (Pashler et al., 2008).

Analytical framework

A quantitative online survey was administered based on the established learning style tool, the Honey and Mumford Learning Style Questionnaire (LSQ) (Duff & Duffy, 2002). Although the LSQ was developed to measure learning styles, not LSV, De Vita (2001) points out that it is widely used, thoroughly reviewed in the literature, and thus understood as a tool with higher validity and predictive accuracy than, e.g. the Learning Style Instrument. The LSQ identifies four learning archetypes: the activist, who learns through experience; the reflector, who learns through reflective observation; the theorist, who benefits most from frameworks and concepts; and the pragmatist, who prefers to learn from active experimentation. Based on 80 items to be rated, an individual receives raw scores that can be categorised as very low, low, moderate, vigorous, or robust for each learning style.

Regarding the dependent variable, this study builds on past research. In the literature, quantitative research has provided evidence that particular learning styles positively impact classroom success and learners' satisfaction (Dunn et al., 1989; Griggs, 1992; Thomson & Mascazine, 1997).

Data preparation and analysis

Several options were possible, with special attention paid to the independent variable. A decision was made in favour of a proxy that categorises various levels, which were compiled and calculated according to the logic outlined in Table 1, resulting in a 10-point scale. Variable operationalisation represents a crucial task for researchers. Any first-generation operationalisation reflects its nascent state, lacking rich, two-sided evaluations and detailed descriptions of observations until thorough tests and discussions have been conducted. Honey and Mumford (2009) distinguish between learning style preferences and actual skills. However, skills could be more complex to test with surveys than preferences. This study contributes to this task by proposing a first generation of LSV indicators that will need to mature further over time. This aligns with other attempts to operationalise multidimensional constructs longitudinally, such as corporate performance or internationalisation, fields where congruent and divergent alternatives have emerged over decades (Amann & Khan, 2017).

Table 1. Overview of learners based on LSV

DESCRIPTION OF CATEGORY	INCLUDED CASE PER CATEGORY	STYLE VERSATILITY INDEX SCORE
PERFECT	All four learning styles are rated as very strong	10
EXTREME	3 rated very strong, 1 rated strong	9
VERY HIGH	2 rated very strong and 2 rated strong, 1 rated very strong, with 3 remaining rated as strong	8
HIGH	3 rated at least as strong, 1 medium	7
HIGHER	3 rated as strong, 1 as weak	6
MEDIUM	2 clearly strong and 2 medium scores, i.e. no apparent weaknesses	5
LOWER	2 rated as strong, at least 1 as weak	4
LOW	Neither any strengths, nor extreme weaknesses – all rated as medium or a maximum of 2 lows	3
VERY LOW	1 strong and 2 or 3 maximum scores at the medium level	2
LOWEST	1 strong and a maximum of 1 medium score	1

Source: Own elaboration.

As for the dependent variable, this study is based on the assumption that a clear focus and primary analysis of students' grades are the primary ways of operationalising learning success. Learning outcomes were operationalised quantitatively using achieved grades (GPA), ranging from 1 (lowest) to 10 (highest). While there are multiple grading scales, the one used in this study is influenced by the established practices of the school chosen as a research partner, a private business school in Bangalore.

For further exploratory analysis, this study added a more refined view of learning outcomes, operationalising them based on a learner and program participant's subjective perceptions of the Kirkpatrick (1976, 2016) model of learning levels. According to this model, such subjective perceptions refer to a learner's initial reaction to a learning intervention, e.g., satisfaction, gained knowledge, perceived behavioural change, and perceived value, which are relevant to employers. The reactions are phrased in easy-to-score, subjective perceptions and corresponding statements: "I am very happy with my program at institution X", "I feel I get a very good return on investment", "I learn on multiple levels, such as knowing, doing, being", "I learn a lot of new knowledge", "The program positively changes my behaviour", "What I learn in the program will most likely lead to a measurable positive impact at my (future) employer's organisation", "I am very satisfied with my learning progress". The Likert scale goes from 1 to 5, where 1 = strongly agree, 2 = agree, 3 = neither agree nor disagree, 4 = disagree, and 5 = strongly disagree.

Further analysis shows that the cumulative grade point average (GPA) ranges from 1 (the lowest possible value) to 10 (the highest possible value) at the institution where the study was conducted (see below). Satisfaction is measured on a five-point Likert scale, with the answer indicating whether a student is satisfied with the programme (1 = not at all, 5 = very much). The multivariate analysis treated all dependent variables – GPA, agreement scores, and perceptions — as pseudo-metric variables.

Blaxter et al.'s (2006) statement that "research is the art of the feasible" (p. 157) guides first efforts towards the operationalisation of the dependent variable. GPA is a proxy with upsides, such as ease of accessibility and overall availability, and downsides, primarily due to its reductionist nature, as learning outcomes could also be more qualitative or multidimensional. In many Indian business schools, particularly at leading institutions such as the Indian Institutes of Management, student performance is evaluated on a 10-point GPA (or CGPA) scale, where graduation typically requires a minimum cumulative score of 4.5 out of 10, though thresholds vary slightly by institution. Because grading is often relative (curved), the cohort average usually falls between 6.0 and 7.0, meaning that a GPA in this range reflects solid, average performance. A score of 7.0 or above is generally considered good to very good, placing a student above the mean, while a GPA of 8.0 or higher is regarded as excellent and often corresponds to top-tier academic standing within the cohort; conversely, scores below 6.0 may be viewed as weak and can limit competitive placement opportunities.

Regarding the overall model summary, the following applies.

GPA = dependent variable (learning outcome)
LSV = Learning Style Versatility Index
Age = age (in years)
Gender = coded (0 = male, 1 = female)
StudyLevel = dummy (0 = undergraduate, 1 = graduate)

The regression model predicting GPA from Learning Style Versatility (LSV), age, gender, and study level is formulated as follows:

$$GPA = \beta_0 + \beta_1(LSV) + \beta_2(Age) + \beta_3(Gender) + \beta_4(StudyLevel) + \varepsilon$$

Regarding control variables, previous research has identified a deteriorating relationship between grade success and age (Peiperl & Trevelyan, 1997). This study aimed to control for any age-related impact and therefore entered age as a metric variable. While Peiperl and Trevelyan (1997) found no evidence that gender affects grades, other studies, such as Yeung (2011), suggest the potential impact of gender on educational grades. As India remains a country with significant gender inequality (Sharma, 2016), female students may feel compelled to study harder in order to achieve social mobility and career success.

This does not, however, mean that their grades are better. They might, on average, be lower in business schools or at least similar to those of men in social aspects of business, such as organisational behaviour or change, but worse in more technical courses, such as corporate finance and decision modelling (Markman, 2017). This study also controlled for such a gender effect. Finally, as outlined below, study participants were at the bachelor's and MBA levels, and the empirical analysis examined whether the track or study level affected overall learning outcomes. These control variables were entered into the regression as dummy variables.

Additionally, Cameron et al. (2015) argue that achieving learning outcomes can be complex, encompassing the impact of demographic factors, including culture and age, as well as more internal factors, such as course content and teaching styles. To at least partially consider factors beyond age, the survey includes questions that assess a student's perception of the variety of teaching styles used, based on a 5-point Likert scale ("Programme faculty use a variety of teaching methods"). They form part of a further exploratory analysis. To test the hypothesis, a multivariate regression analysis was conducted using SPSS. The following section first presents the descriptive statistics, then presents the results of this regression and the empirical test of the impact of LSV on GPA.

RESULTS

Table 2 below summarises the descriptive statistics. The survey yielded 120 fully completed responses out of 206 enrolled students (58%). The majority of participants from both study levels were included, and a sample selection bias test revealed no significant gender biases throughout the study. The research partner institution's student body is 66% male; no gender bias was identified in the responses. The average ages of undergraduate and graduate students are close to one another, suggesting that individuals often pursue graduate studies at an early age.

Table 2. Descriptive statistics of key variables

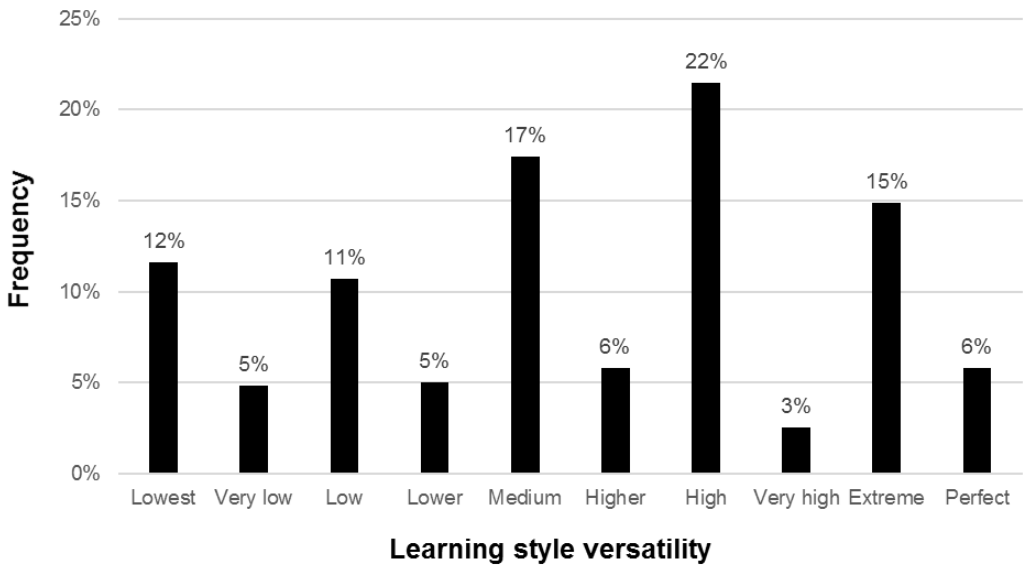
CRITERIA	BBA (BACHELOR OF BUSINESS ADMINISTRATION)	MBA (MASTER OF BUSINESS ADMINISTRATION)	TOTAL
RESPONSE RATE	62 out of 99 (63%)	58 out of 107 (54%)	120 out of 206 (58%)
GENDER SPLIT	71% male, 29% female	61% male, 39% female	66% male, 44% female
AGE MIN./MAX./AVERAGE/STD. DEVIATION	19, 25, 20.03, 1.11	20, 25, 22.31, 1.22	19, 25, 21.14, 1.62
INDEPENDENT VARIABLE: LSV (LEARNING STYLE VERSATILITY), MIN./MAX./AVERAGE/STD. DEVIATION	1, 10, 5.85, 2.36	1, 10, 6.64, 2.38	1, 10, 6.24, 2.39
DEPENDENT VARIABLE: GPA (GRADE POINT AVERAGE), MIN./MAX./AVERAGE/STD. DEVIATION	1, 8.67, 6.99, 1.8	5.9, 9.50, 7.93, 1.02	1, 9.5, 7.45, 1.54

Source: Own elaboration.

The average age might also explain why all students were single, making it impossible to measure the impact of marital status on learning outcomes. On average, grades are better at the graduate level, as probably more is at stake when graduating from a master's programme, and graduate admission requirements favour individuals who perform better at the undergraduate level. Consequently, the level of study (undergraduate versus graduate) was included in the subsequent analysis as an additional dummy variable.

Figure 3 provides an overview of the distribution of participants across the categories identified in the LSV index, as shown in Table 1. Learners represented in this study cover all conceptualised categories: perfect (5.8%), extreme (14. 9%), very high (2.5%), high (21.5%), higher (5.8%), medium (17.4%), lower (5%), low (11%), very low (4.1%), and lowest (11.6%). Some segments are obviously smaller. Future studies could cluster groups if this phenomenon persists.

Figure 3. Distribution of learners across versatility categories



Source: Own elaboration.

Comparing these percentages with those reported by Honey and Mumford (2009), several idiosyncrasies of this study become apparent. The rate of less-versed learners, defined as individuals with one or two strong preferences, is generally 55%, compared with 38.1% in this study. The segment of 'strength-free' learners without clear preferences has been reported to be 38% in general, versus 10.7% in this study. This study used linear regression analysis, with age and gender as control variables, as suggested by the literature, to examine the impact of LSV on learning outcomes in general and on GPA specifically.

The model fit summary yields $R = .463$, $R^2 = .187$, and $F(4, N–5) = 7.891$, $p < .001$. The following table further summarises the model. The following table summarises the model based on the primary data gathered.

Table 3. Results of the regression analysis

PREDICTOR	B (STANDARDISED)	P	INTERPRETATION
LSV	.247	<.01	Higher LSV predicts higher GPA
AGE	.119	.307	Not significant
GENDER	.211	.123	Not significant (trend only)
STUDYLEVEL	.321	<.01	Graduate level predicts higher GPA

Source: Own elaboration.

While the R of 0.463 indicates a relatively weak correlation, the R-squared of 0.187 suggests that the model explains 18.7% of the variation in grades. Based on the analysis of variance (ANOVA), the F-value of 7.891 indicates the model's overall significance (df = 4). At a highly significant level (p <), the model provides a good fit for the data. Testing the hypothesis formulated above yielded a positive result. As for the coefficients, LSV as a variable with a standardised coefficient Beta of .247 is significant at p<.01 (with the standardised coefficient beta values for age .119 and its p<.307, gender .211 with a significance level of p<.0123, and the study level dummy .321 with p<.01). If one differentiates further between the undergraduate and graduate level, the results are confirmed, which could be interpreted as corroborating parallel test reliability.

In contrast and taking the exploratory analysis further than the confirmed hypothesis H1, the analysis did not detect a significant impact for LSV on overall satisfaction with the program or with the learning progress, perceived return on investment, perceived learning opportunities on multiple levels, perceived learning of new knowledge, the perceived positive impact on behavioural changes, or perceived potential benefit of the learning for employers. None of the linear regressions yielded a statistically significant positive or, for that matter, negative impact. The following section discusses these results further.

DISCUSSION

Substantiation of the proposed conceptual framework

This is the first study to quantitatively demonstrate the positive impact of LSV on grades. If learners are more versatile, they can benefit from the diverse approaches to learning employed by different faculty members. This aligns with the eco-effectiveness logic outlined in Figure 2 above and is consistent with the hypotheses derived from the literature as part of the deductive research process. Reality aligns with theory. Based on Ashby's (2011) concept of the law of requisite variety, the underlying logic emphasises LSV as a key variable and coping mechanism for learners facing learning challenges in their educational environment. Therefore, the study results align with the suggested conceptual framework. As there are no prior studies measuring the impact of LSV on learning outcomes, this study provides the first empirical evidence of its importance. Results are clearer than the previously identified ambiguous impact of LS.

Substantiation of the importance of controlling for gender as a variable

A key insight acquired by delving deeper is that women perform better than their male counterparts. As no other studies measure learning style versatility among business students in this explicit form, and the literature does not (yet) cover the topic, there is an opportunity for future research to confirm this observation and potentially generalise it in more gender-focused studies investigating the trend identified in this empirical investigation presented above. Women's grades are better, yet the reason for their superior performance might not be a different level of LSV. Filtering out gender from the variance by modelling it as a control variable reveals differences in

LSV among women, with a higher average LSV, though not statistically significant. The results are in line with Wallen et al. (2017), who find that women might "respond to gender norms by reducing public assertiveness but not private effort" (p. 1). It therefore could be that not female students' similar LSV, but rather the more dedicated effort they invested, explains their better performance. This should be considered in gender equality debates and, therefore, represents an opportunity for further research.

Substantiation of the complexity in learning outcome-related research

This study also highlights the need to appropriately distinguish among various methods of measuring learning outcomes. Grades are important in business schools because, as Robles and Roberson (2014) outlined, they impact both study efforts and perceived future success. Yet the same authors warn that overemphasising grades can distract from more holistic learning, long-term retention, and effective scholarship. This insight links the study's tangible results to the implications outlined in the next section.

Various authors have called for a richer view of this inarguably multidimensional construct. Kirkpatrick (1976, 2016) suggests a four-layer pyramid. Philips (1996) added a fifth layer. Amann et al. (2017) subsequently offered a sixth layer. This study's results show that while multiple layers mirror the multidimensionality of the learning construct, such emerging insights into LSV make the analysis and discussion of learning outcomes a more challenging enterprise. What is meant when researchers and practitioners refer to learning outcomes, or learning? Teacher-rated learning, in the form of grades, is affected and can be enhanced by a learner's LSV. Similar generalisations cannot be made for other outcomes in quite the same straightforward way. The conceptualisation and operationalisation of 'learning outcomes' matters considerably.

This train of thought is exemplified by the following logic. Even a less versatile learner can perceive a personal learning journey as satisfying if they gain new knowledge or change their behaviour in response to the learning intervention, have more to offer an employer, or receive a return on their education and investment. Conversely, there are a plethora of factors that can invert such perceptions, e.g. when a private business school is over-commercialised (Bok, 2003), if faculty seem lost or distracted by (e.g.) ever more aggressive publish-or-perish pressures (Smeyers et al., 2014), or if the type of business school is simply not right for the learner due to it being (e.g.) too conservative, reactive, uninspiring, or out of touch with practical relevance. Not all schools are created equal (Lorange, 2012), and regardless of a given LSV, the context must be a fit or enabling one, too. Studies should clarify how they address the multidimensionality of learning outcomes and specific contexts.

CONCLUSION

This study aimed to conceptualise, operationalise, and empirically test the impact of LSV on learning outcomes, thereby highlighting the importance of LSV as a proposed innovation in LS research and practice. Having confirmed the hypothesis, the overall purpose of the study has been fully achieved.

As a consequence, several innovations were made in an established field, which are detailed below. The study contributes to ongoing debates in several ways. It extends the field and theory of learning styles by not only positing but also empirically substantiating (in a single setting) that LSV can help us understand learning outcomes, at least those related to grades. LSV refers to an individual's preference for effectively applying multiple learning styles, contingent upon the learning challenge. This could mark the beginning of a development that has been observed to be taking hold and making good progress in the leadership field and related literature. Here, different leadership styles were first acknowledged. Still, the real performance of the concept became evident in the behaviour of versatile leaders themselves. From Kaiser and Kaplan (2000) to Kaiser

and Sherman (2025), there is substantial empirical evidence of the superiority of a versatility view on leadership. The same trajectory could emerge for versatility in learning styles.

This study provides the first empirical substantiation that, within the study's limits and the project's analysis, LSV matters. The study continues by examining the first proxy-level measure of leadership style versatility. This allows for initial experiences with variable operationalisation to be built on in future studies. The next contribution this study makes lies in its trajectory building. It suggests shifting attention away from merely examining learning styles, as in studies such as Cameron et al. (2015), toward their versatility.

Simultaneously, this study calls for additional quantitative replication studies in other contexts and in-depth grounded theory research to better understand the patterns and dynamics at work. Once progress has been made, the final part of the nomological net, as initially presented in Figure 1, can be targeted. A prescriptive research phase, pragmatically following appreciative inquiry, can then help optimise reality through actionable knowledge as part of a holistic ergo-ecology view of LSV specifically and of learning in business schools more generally. When business schools are criticised for failing to meet expectations regarding relevance or ethics, this study strongly advocates greater attention to a learner's individuality. This can be done either as a means to an end (to produce better graduates and better career prospects), or, more ideally, as an end in itself to increase dignity orientation in business schools and implement the promising United Nations Global Compact PRME.

Recommendations and the practical value of the study

The findings of this study suggest that management educators and program designers should move beyond static categorisations of learning styles and instead foster learning style versatility as a developmental capability. Practically, this implies designing curricula that deliberately expose students to a variety of pedagogical approaches, such as case discussions, simulations, reflective exercises, and experiential projects, thereby encouraging adaptability in how students engage with learning tasks. For institutions, integrating diagnostic tools and feedback mechanisms that help learners recognise and expand their learning repertoire could enhance both academic performance and long-term managerial effectiveness. From a broader perspective, the study offers practical value by aligning educational design with the realities of complex, dynamic business environments, where success depends less on fixed preferences and more on the ability to flexibly adjust one's cognitive and behavioural approach to diverse challenges.

Implications, limitations, and suggestions for future research

The first set of implications relates to practitioners. A better understanding of learning styles and LSV offers several insights that would be useful to business school deans, program directors, individual faculty members, and business schools as institutions. Business school rankings are linked to projected future success, for example, in terms of executive education income (Schwertfeger, 2018). Several established ranking criteria are directly linked to learning success. For example, Köksalan et al. (2010) list salary increases, perceived value for money, and career progress as relevant criteria for standard business school rankings. Better, i.e., more versatile learners score higher GPAs, which impacts their career and earning potentials. LSV emerges as a strategic variable that needs to be managed actively.

In addition to this functionalist view, a broader symbolic value aspect is emerging. Knefelkamp (2003) emphasises that reaching all students and providing curricula that cater to diverse needs can be challenging in a democratic and pluralistic environment. However, becoming better at learning could be a more widely shared interest. Similarly, the United Nations Principles of Responsible Management Education encourage more responsible innovations in business schools (Godemann et al., 2014). Humanistic management and business schools equally call for a greater emphasis on dignity and individuality (Amann, 2025). Respecting and preserving human dignity in

all facets, including a learner's individuality and very own LSV, is one crucial way responsible and humanistic management education should proceed. Therefore, this study can inspire practitioners regarding ways to bring responsible management education to life.

Beyond practitioners, this study offers implications for the research community. The study results argue in favour of more research on LSV, not merely individual LS. Equally, it calls for integrating and endogenising LSV in a holistic approach to ergo-ecology, as described by García-Acosta et al. (2014) above. More specifically, this study addressed a specific gap in the literature regarding learning styles. Firstly, while the field of leadership styles has evolved, a similar emphasis on versatility has only recently emerged, primarily in this study, which has focused on leadership style versatility. The field of leadership versatility inspires a potential opportunity. One of the study's aims is to build a learning-styles versatility trajectory, believing that disseminating this view is a crucial next step. However, the scope of each research project had to be clearly defined, resulting in the presentation of only the results above. Thus, the study simultaneously calls for the continued evolution of leadership-style-oriented research into a field that will more fully embrace an ergo-ecological view, in which the ergonomics of leadership styles within larger systems is further investigated.

As with basically any other study, this one also has limitations with inherent suggestions for future research. First, now that the importance of leadership style versatility has been established, at least with initial evidence, it makes intuitive sense to pursue three avenues for future research. The study was limited to a single institution in one city within a particular cultural context, so other school vicinities, cultures, or strategic positions could not be explored. Other schools might well attract different types of students and learners based on their brand, strategy, marketing budget, admission guidelines, and, last but not least, their cultural context. Further research should shed light on other such contexts to confirm or elaborate on the analysis.

Second, more qualitative research is needed to establish why the identified empirical results materialise in the first place and how meshing various components occurs or does not. This study started with a hypothesised linear link between LSV and GPA. Given the limited literature on LSV, more sophisticated hypotheses could not be easily derived. This research into the identified link between LSV and grades can provide them.

Third, the study has provided a foundation for future prescriptive research, as mentioned in the nomological approach represented in Figure 1. Regarding the nature of the research we require, less positivist and more phenomenological research should ensue. Honey and Mumford (2009) had difficulties finding extreme and perfect levels of learning versatility, for example, in the form of learners who effectively prefer and apply three or four learning styles. Their published data date back to 2009 and remain at a very rudimentary, observational level, merely reporting percentages of individuals with more than one strength within an LS category. It is conceivable that a VUCA world demands more of current program participants than it did more than 15 years ago. Grounded theory is suggested to advance the theorising process and to promote the inquiry, with practical improvements as the next steps. For example, cases should be explored for all four quadrants in Figure 2, investigating holistic learning versatility ergo-ecology, including in-depth case studies on eco-effectiveness, eco-sufficiency, eco-inefficiency, and eco-ineffectiveness. It is also advisable to further break down the 2x2 matrix, especially in the middle of the LSV-GPA link, where there might be more dynamics.

Defining a trajectory for the LSV field should not stop there. The third key limitation of this study resides in finding a pragmatic way to operationalise LSV. It builds on an established learning-style tool that has been field-tested. Yet, future studies are encouraged to explore different ways of conceptualising and operationalising LSV, allowing for a phase of divergence before organised conferences on dominant and promising proxies. Such a development to widen the scope and revisit assumptions should also review ways to overcome the view that learning styles and

versatility are innate, i.e., it should demonstrate that versatile learners are not only born but often made.

Engels and De Gara (2010) identify migrations in the learning style debate, whereas Compton and Compton (2017) refer to progression. Business school graduates are likely to experience such transitions, migrations and progressions when their classroom learning involves various formats of lectures and case discussions that can shift practices towards training and learning on the job.

Revisiting assumptions in this way represents a typical development in the nascent field of LSV. The study could not rely on a rich set of tools that are thoroughly reviewed in the literature and empirically tested in previous studies, as has been done when only learning styles are available to work with. In contrast, other fields, such as international management, in which measuring the degree of internationalisation and financial performance of global operations is a core topic, could rely on 40 years of history, studies, experience, single-item or composite indices, to thoroughly understand variable operationalisation and concrete proxies (Glaum & Oesterle, 2007).

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