

FROM LEARNING VALUE TO SUSTAINABLE ACTION: MOTIVATIONAL PATHWAYS IN THE CONTEXT OF HIGHER EDUCATION AND ORGANISATIONAL ETHICS

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Abstract. This study investigates how students' perceptions of the value and meaning of learning translate into sustainable and prosocial behavior through competence/autonomy and moral orientation. Cross-sectional survey data were collected from 417 university students, and mean composite scores were computed for all variables (a pragmatic approach given the survey design; latent measurement modeling was beyond the scope of the present analysis). A serial mediation model (PROCESS-type, Model 6) with standardized variables and 1,000 bootstrap resamples was estimated, controlling for religiosity/spirituality, course delivery mode, and volunteering hours. Learning value strongly predicted competence/autonomy ($\beta = .71$, $R^2 = .51$), which subsequently predicted moral orientation ($\beta = .49$). In the final model, competence/autonomy remained a significant predictor of sustainable behavior ($\beta = .28$, $p < .001$; model $R^2 = .18$), whereas moral orientation was not statistically significant ($\beta = .08$, $p = .247$). The indirect effect of learning value on sustainable behavior via competence/autonomy was substantial ($\beta = .20$), while the serial pathway through both mediators was small and non-significant. Most of the total effect of learning value ($\beta = .36$) was indirect. Although the cross-sectional and single-country design limits causal inference and generalizability, the findings highlight competence-building and autonomy-supportive learning designs as key mechanisms for transforming meaningful learning into sustainable and ethics-aligned actions.

Keywords: learning value, competence and autonomy, sustainable behavior, education for sustainability, organizational ethics.

JEL Classification: I23, M14, Q56.

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Notations

Abbreviations

CSR – corporate social responsibility;
ESD – education for sustainable development;
HE – higher education;
OCBE – organizational citizenship behavior for the environment;
SDT – self-determination theory;
SDGs – sustainable development goals;
TPB – theory of planned behavior;
UN – United Nations;
UNESCO – United Nations Educational, Scientific and Cultural Organization;
UNECE – United Nations Economic Commission for Europe.

1. Introduction

Sustainability is no longer just a “statement of good intentions” found on the glossy pages of corporate social responsibility reports; it has become a normative obligation encoded in the United Nations 2030 Agenda (United Nations, 2015) and a condition for the survival of organizations. The climate crisis, loss of biodiversity, and social inequalities show that no sustainability discourse that does not permeate the daily decision-making processes of companies and public institutions is convincing anymore. Within this context, the divergence between an organization's sustainability claims and the daily action of employees most likely constitutes one of the most important ‘gaps’ in management research today (Bansal & DesJardine, 2014; Ones & Dilchert, 2012).

In addition to education and competence development, universities are steadily being called on to serve as socialization arenas for sustainability norms and ethical

sensibilities. The ESD for 2030 programme of action by UNESCO sees learning as a capability building process for sustainable lifestyles. However, curriculum reviews show that SDG integration is largely fragmented and tends to be focused on electives rather than core programmes (Molina et al., 2023; Vilalta et al., 2018; UNESCO, 2019, 2020b).

According to motivation psychology, particularly self-determination theory (SDT), sustainability norms will become durable when learning contexts support autonomy and competence (Deci & Ryan, 2000; Ryan & Deci, 2000). Students in need-supportive classrooms are found to be more engaged and hold more internalized value orientations (Jang et al., 2010; Niemiec & Ryan, 2009).

Complementary perspectives reinforce this logic. In expectancy–value theory, students invest effort when learning is subjectively valuable (Eccles & Wigfield, 2002); in the Theory of Planned Behavior, intentions translate into action when perceived control is high (Ajzen, 1991). Identity-based research further suggests that moral or environmental self-identity can support prosocial and pro-environmental choices, but typically alongside efficacy and supportive contexts (Aquino & Reed, 2002; van der Werff et al., 2013; Udall et al., 2021; Gifford & Nilsson, 2014).

Against this backdrop, the present study tests a motivational pathway in which perceived learning value predicts competence/autonomy (M1), which may foster moral orientation (M2), and ultimately sustainable and prosocial behavior (Y). Using cross-sectional survey data from 417 higher education students, we estimate a sequential mediation model with bootstrapped indirect effects (Hayes, 2018; MacKinnon, 2008). By jointly modeling competence/autonomy and moral orientation, we clarify whether sustainability education should prioritize ‘value messaging’ or the design of autonomy-supportive competence-building experiences that make ethical action realistic in everyday settings.

Accordingly, the study addresses two research questions: (RQ1) To what extent does competence/autonomy mediate the relationship between learning value and sustainable behavior? (RQ2) Does moral orientation contribute incremental explanatory power for sustainable behavior beyond competence/autonomy within the same model?¹

2. Theoretical framework and literature review

2.1. The value and meaning of learning: The path to the value–action gap

The value of learning is not limited to instrumental utility (grades, credits, employability). In expectancy–value terms, investment depends on subjective value (interest, importance, utility, and perceived cost) together with expecta-

tions of success (Eccles & Wigfield, 2002). Task significance also boosts engagement (Grant, 2008). To affect behaviour outside the classroom, sustainability learning should thus feel useful and meaningful.

Despite the endorsement of climate change objectives or SDG goals, and attempts to integrate them into sustainability education, the value-action gap still persists (Blake, 1999; Kollmuss & Agyeman, 2002). In higher education, barriers such as low self-efficacy, limited resources, and competing priorities can act as a hindrance to action even in those students who are seen as symbolically in favour of sustainability (Portus et al., 2024; Teather & Etterson, 2023; Grunwald et al., 2025).

When sustainability is treated only as a peripheral add-on rather than a core professional competency, the fragmented curricular integration can widen this gap (McCowan, 2023; Leal Filho et al., 2020).

Climate and sustainability education can invoke powerful feelings – like anxiety and guilt – that lessen our agency, when courses emphasize threat without pathways for action. Researchers in climate education suggest that when students have the knowledge of climate actions and a concrete opportunity to act, their sense of efficacy can be protected, and paralysis reduced (Tang, 2025; Hu et al., 2025).

2.2. Self-determination theory, competence/autonomy, and sustainable behavior

Self-determination theory (SDT) understands human motivation not merely as a “stimulus–response” system sensitive to external rewards, but as a dynamic process based on fundamental psychological needs such as autonomy, competence, and relatedness (Deci & Ryan, 2000; Ryan & Deci, 2000). According to this theory, when individuals’ environments support these needs, they tend to internalize external regulations and transform them into autonomous, value-aligned behaviors.

SDT research indicates that sustainable action is more likely when motivation is autonomous rather than controlled. Autonomy-supportive contexts are linked to more persistent pro-environmental behavior (Baxter & Pelletier, 2020; Masson & Otto, 2021).

In higher education, autonomy- and competence-supportive sustainability learning (e.g., authentic projects, feedback, and choice) predicts stronger internalization and stronger intentions to act (Barth & Rieckmann, 2016; Juma-Michilena et al., 2023; Ronkainen et al., 2025).

Accordingly, we treat competence/autonomy as a combined motivational capacity – feeling able to handle challenging tasks and to initiate action – expected to bridge learning value and sustainable behavior (Ones & Dilchert, 2012).

Beyond SDT, ESD scholarship frames competence as an “action capability”: learners should be able to anticipate consequences, collaborate, and intervene in socio-ecological problems, not only understand them. Competence frameworks and policy roadmaps similarly emphasize

¹ The abstract of this article was presented at the International Conference on Management, Economics & Finance held in Vienna, Austria, on 28–30 November 2025. The current article substantially extends that earlier contribution through full theoretical development, complete statistical reporting, and comprehensive discussion.

action competence and agency as intended outcomes of sustainability education (Vare et al., 2019; UNECE, 2012; Tilbury, 2011; Adom̄bent & Hoffmann, 2013; Cebrián & Junyent, 2015; Brandt & Barth, 2020).

2.3. Moral identity, moral orientation, and environmental self

Moral identity theory posits that moral traits influence behavior when they are central to the self-concept (Aquino & Reed, 2002). In the sustainability domain, environmental self-identity and related moral orientations predict pro-environmental intentions and behavior, although effects are typically moderate and context-dependent (van der Werff et al., 2013; Udall et al., 2021). Meta-analytic evidence suggests a positive, yet modest, link between identity-related constructs and environmental concern, supporting identity as a real but not exclusive driver of sustainability engagement (Lou & Li, 2021; Gatersleben et al., 2014). Here, moral orientation represents an other- and planet-focused purpose for learning, and we test whether it explains sustainable behavior beyond competence/autonomy (Ciōc̄rlan et al., 2025).

In university contexts, learning experiences that connect knowledge to responsibility and justice may strengthen identity-relevant moral orientations (Droubi et al., 2023). We therefore treat moral orientation as a purpose horizon – using what one learns to benefit others and the planet – which may, in some contexts, support sustainable behavior.

2.4. Sustainable and prosocial behavior: From organizational citizenship to environmental citizenship

At the micro level, sustainable performance depends partly on discretionary behaviors such as organizational citizenship behavior for the environment (OCBE) – voluntary acts that support environmental performance beyond formal role requirements (Boiral, 2009; Luu, 2019). Prior work links these behaviors to ethical and green climates, perceived support, and individual capability, suggesting that competence and autonomy may be key psychological foundations for sustainability-oriented citizenship (Ahmad et al., 2021; Azam et al., 2022; Kanwal et al., 2024; Liu & Qi, 2022).

Since sustainability behaviour happens with regards to workplace and lifestyle, our outcome measure includes environmental and prosocial behaviour. As research organizational suggest that sustainable behaviors not causing harm to others are not only subjected to norms but also to climates and cultures that ease “doing the right thing” (Assoratgoon & Kantabutra, 2023; Fietz & Günther, 2021).

2.5. Sustainability in higher education, the value–action gap, and the organizational ethics connection

International frameworks propose higher education as a leverage for sustainable development. The mechanism

here is mainly through SDG 4.7 and the ESD for 2030 road-map by UNESCO. These instruments note the vital need for knowledge, skill and disposition for sustainable living (United Nations, 2015; Saini et al., 2023; UNESCO, 2020b).

At the institutional level, commitments to sustainability can be seen as largely symbolic. That is to say, universities may publicly endorse the SDGs but the everyday practices on campus lag, including procurement, travel norms, waste systems, teaching incentives etc. Recent frameworks use the term implementation drift or “academic capture,” to describe how incentives and institutional culture can dilute sustainability outcomes in practice (Lachapelle et al., 2024; Wiśniewska et al., 2025).

Many universities are struggling to convert their rhetoric of sustainability into everyday practices. The implementation is a function of pedagogic design and institutional culture (Leal Filho et al., 2023; Trevisan et al., 2024).

The sustainability responsibilities of universities are shaped by policy environments. European Green Deal is a critical document that highlights education and skills for greening transition (European Commission, 2019). Similarly, the right to education and other human-rights framings increasingly frame environmental education as a right and obligation in the 2025 timeframe (Right to Education, 2025). Such frameworks strengthen that sustainability education is not just optional messages but a public good.

This prompts us to focus on motivational mechanisms: when graduates leave university with both competency/autonomy for action and a purpose-oriented moral horizon, they are more likely to carry sustainability commitments into organisational life (Ones & Dilchert, 2012).

2.6. Research model and hypotheses

We test a serial mediation model in which learning value (X) predicts competence/autonomy (M1), which may shape moral orientation (M2), and ultimately sustainable and prosocial behavior (Y).

Perceived learning value should predict competence/autonomy, as value supports effort and mastery (Eccles & Wigfield, 2002; Ryan & Deci, 2000). Therefore:

- H1. The perception of the value and meaning of learning is positively related to students’ levels of competence/autonomy.

Competence/autonomy should also predict moral orientation, consistent with SDT internalization claims and moral identity perspectives (Deci & Ryan, 2000; Aquino & Reed, 2002). Accordingly:

- H2. Competence/autonomy positively predicts students’ levels of moral orientation.

Moral orientation is expected to relate to sustainable behavior, drawing on identity-based models of pro-environmental action (van der Werff et al., 2013; Udall et al., 2021). Therefore:

- H3. Moral orientation is positively related to students’ levels of sustainable and prosocial behavior.

Because perceived control often constrains everyday sustainable action, competence/autonomy is also expected

to predict behavior directly and to carry much of the indirect effect from learning value (Ajzen, 1991; Gifford & Nilsson, 2014). Accordingly:

- H4. Competence/autonomy indirectly influences sustainable and prosocial behavior through moral orientation (serial mediation).

We therefore expect the total indirect effect to remain meaningful even when the direct effect is reduced. In this context:

- H5. The perception of the value and meaning of learning has a significant total indirect effect on sustainable and prosocial behavior through competence/autonomy and moral orientation; this effect persists even when controlling for demographic variables and control variables such as religiosity/spirituality.

Together, these hypotheses test whether competence/autonomy and moral orientation represent distinct motivational bridges from meaningful learning to sustainability-oriented behavior.

3. Method

This section describes the research design, sample, measures, and analysis procedures.

3.1. Research design

This investigation is a correlational study that was conducted through a cross-sectional survey design on higher education students. The main objective is to investigate how learners' perceptions of the value and meaning of learning (X) are mediated through competence/autonomy (M1) and moral orientation (M2) to sustainable and prosocial behaviour (Y).

To achieve the aim defined, the serial mediation model based on Hayes' regression-based conditional process analysis approach was adopted and a structure corresponding to Model 6 in Hayes proposed PROCESS framework was utilized. Model 6, in substantive terms, represents a sequential pathway ($X \rightarrow M1 \rightarrow M2 \rightarrow Y$) while at the same time estimating the direct effects $X \rightarrow M1$, $X \rightarrow M2$, $M1 \rightarrow M2$, $M1 \rightarrow Y$, and $M2 \rightarrow Y$ (together with the residual direct effect $X \rightarrow Y$). The specification in this study is based on the framework that first learning value strengthens competence/autonomy, which may then shape moral orientation (and that these may either independently or jointly relate to sustainable behaviour (see also MacKinnon, 2008; Hayes, 2018)).

The model includes a mixture of linear regression equations that makes it easy to read, while representing complex motivational chain in conceptually accurate interpretation, both for methodological and applied readers.

3.2. Participants and sample

The data for the analyses consisted of the responses from $N = 417$ higher education students who had fully answered

all items related to the four key components. The analyses concentrate on broad motivational and behavioural trends, not on how this institution compares with others, for it utilises a de-identified dataset. Following that, all variables in the serial mediation model followed the complete cases approach meaning that missing data were omitted using the listwise deletion method.

The test subjects (students) may enroll in any type or category of course or program. It was essentially an impact evaluation as we focus on the participants' motivational and behavioral patterns not their demographic spread. Hence, demographic variables (age, gender etc) were assessed only at the descriptive statistics level. In the model, instead of secondary controls, we used three controls directly related to the study's theoretical framework (religiosity/spirituality, course presentation format, time allocated to voluntary activities).

3.3. Measurement tools

A single-session questionnaire was used to measure all variables. The researchers assessed three blocks of learning: value, competence/autonomy and moral orientation. Seven-point Likert scales (1 = "strongly disagree," 7 = "strongly agree"; adapted to the original items) were used for this purpose. Sustainable behaviour was assessed using a five-point frequency scale (1 = very rarely/never, 5 = very often). The operational definitions of each of the composites used in the analyses are shown below.

3.3.1. Value and Meaning of Learning (X)

Survey items in block Q17 constructed the Value and Meaning of Learning variable. The composite for Q17_test was calculated using a total of 6 items after removing item q17_4 (specifically for attention control: what I learnt will be useful for me in the future; the content of the course is valuable and meaningful). A Likert scale was used to answer items 1–7, an average score for each participant was computed.

According to Nunnally and Bernstein's psychometric tradition, internal consistency was found to be Cronbach's $\alpha = .857$; this value is above the .70 threshold, indicating that measure possesses "good" levels of internal consistency.

3.3.2. Competence/Autonomy (M1)

The items for block Q19 were used to derive the Competence/Autonomy variable. As a control for attention, Q19_8 was excluded and thus we used Q19_1 – Q19_7 and Q19_9. This block includes statements referring to general self-efficacy, "I am competent in my work" and academic competence and the ability to complete tasks.

The composite value is computed by averaging the items. The internal consistency of the composite has an $\alpha = .842$. The value is higher than that generally accepted reliability criteria in the behavioral sciences ($\geq .80$), exhibiting that the scale is not measuring two constructs.

3.3.3. Moral Orientation (M2)

The 6 items (Q18_1–Q18_6) in block Q18 obtained moral orientation. The items refer to the extent to which learning motivation connects with contributing to others, benefiting society, and orienting toward a broader moral horizon (e.g., I want to use what I learn to make a positive difference for others).

The internal consistency of the composite, computed as the mean of the items, is $\alpha = .795$. This level of reliability is in line with similar, short scales used in studies of moral identity, and environmental self (also see Aquino & Reed, 2002; van der Werff et al., 2013).

3.3.4. Sustainable and Prosocial Behavior (Y)

The Q21 block included 13 items (Q21_1–Q21_13) that are related to sustainable behaviour. Items include environmental and pro-social behaviour carried out on a day-to-day basis (e.g., using refill container, sorting wastes, having discussions on environmental issues with friends, engaging in community-based volunteer action). Answering was done on a 1–5 frequency scale and average score of each participant was calculated. The internal consistency for this block was calculated as $\alpha = .891$. This value indicates a high degree of reliability for broad-content behavior indices, which is often seen in sustainable behavior studies.

3.3.5. Control variables

The model included three control variables that originated from the theoretical framework.

- It is a single item self measure of how religious or spiritual the subjects feel themselves. A higher score indicates a stronger religious/spiritual orientation.
- The format of course delivery was a categorical variable that showed whether the course was mainly face-to-face or online or hybrid. The analyses were suitably converted into dummy variables for comparing online/hybrid format against face-to-face delivery.
- Estimated time spent on organized volunteering: A single-item measure of participants' estimates of their weekly time spent on organized volunteer activities, e.g. NGOs, campus communities, social responsibility projects.

All regression equations included these three as covariates to partially control for alternative explanations that cannot be attributed to the value of learning (e.g., religiously based moral orientation, structure constraint of the course context, existing involvement in volunteering).

3.4. Calculation of scale scores and preliminary analyses

Average scores were calculated for all scales on an item basis, so that higher scores implied higher levels of the traits. The reliability of the scale was evaluated by Cronbach alpha coefficient. Reliability values above .70 were acceptable while above .80 were good (Nunnally & Bernstein, 1994).

The learning value, competence/autonomy, moral orientation, and sustainable behavior composites were standardized to z-scores (mean = 0, SD = 1) for comparability and interpretability in the serial mediation analysis. Accordingly, the regression coefficients reported may be interpreted as standardized β values.

Basic relationships within variables and possible outliers were assessed through the calculation of descriptive statistics (arithmetic mean, standard deviation, skewness, and kurtosis values) and Pearson correlations. The preliminary analyses were conducted following standard practice in behavioral science linear modelling, but as results are not tabulated due to space constraints.

3.5. Data analysis strategy

A regression-based conditional process analysis approach was used to test the serial mediation model. The analyses were conducted from a three-equation structure following Hayes' PROCESS.

1. $M1$ (Competence/Autonomy) $\sim X$ (Learning Value) + Controls;
2. $M2$ (Moral Orientation) $\sim X + M1 +$ Controls;
3. Y (Sustainable Behavior) $\sim X + M1 + M2 +$ Controls.

It was assumed that all variables were continuous, and OLS regression employed. To test the indirect effects, we applied the bootstrapping method described by MacKinnon and Hayes; we used the 95% bias-corrected confidence intervals (CI) derived with 1,000 resamples and construed the confidence interval not containing zero as indicating statistical significance.

Within this framework, the following indirect effects were calculated:

- $X \rightarrow M1 \rightarrow Y$: Indirect effect via competence/autonomy (competence pathway).
- $X \rightarrow M2 \rightarrow Y$: Indirect effect via moral orientation (moral pathway).
- $X \rightarrow M1 \rightarrow M2 \rightarrow Y$: Full serial motivational chain.

Standardized coefficients and bootstrapped confidence intervals were reported for each indirect effect. The total indirect effect was computed as the sum of the above three paths. Then, X's total effect on Y before the mediators were added in to the model, as well as its direct effect once the mediators were added, were compared (see also MacKinnon, 2008).

Future studies can validate the measurement model using structural equation modeling and transparent fit-index practices (Hu & Bentler, 1999; Stone, 2021).

Variance inflation factors were used to check potential multi-collinearity. The correlations from the predictors were quite substantial but the VIFs did not exceed moderate (<3) levels and thus did not breach any common thresholds (Kline, 2016).

More information about the covariates and diagnostics of multicollinearity can be found in the Appendix A.

3.6. Ethical principles

Before data was gathered, an ethics approval and informed consent process occurred. The study participants were informed about the aim of the study, their anonymity, and confidentiality. Moreover, they provided voluntary consent. The dataset used in the analysis is de-identified, as no personally identifiable information is collected and results are reported only in aggregate form.

The research was conducted strictly following the principle of voluntary participation, confidentiality and do-no-harm.

4. Findings

To begin with, the reliability and overall distribution characteristics of the scales have been summarized, followed by the presentation of the regression results and indirect effects of serial mediation model. The results are arranged according to each hypothesis but detailed theoretical discussion is left until later.

4.1. Descriptive properties and reliability of the scales

The four main composite variables used in the study – Value and Meaning of Learning (X), Competence/Autonomy (M1), Moral Orientation (M2), and Sustainable Behavior (Y) – were calculated and standardized based on item means (z-scores), as previously mentioned.

The Cronbach's alpha coefficients for all scales ranged from .79 to .89:

- Value and Meaning of Learning (6 items): $\alpha = .857$;
- Competence/Autonomy (8 items): $\alpha = .842$;
- Moral Orientation (6 items): $\alpha = .795$;
- Sustainable Behavior (13 items): $\alpha = .891$.

These values exceed the .70 threshold commonly used to indicate acceptable internal consistency and range from acceptable to very good (Nunnally & Bernstein, 1994).

Table 1 summarizes the number of items, theoretical score range, and internal consistency coefficient for each scale. This table serves as a general "psychometric footnote" regarding the measurement properties of the composites used in subsequent analyses.

Table 1. Summary of scales used in the study and reliability coefficients (source: created by authors)

Scale	Code	Number of items	Theoretical range	Scale type	Cronbach's α
The Value and Meaning of Learning	X	6	1–7	7-point Likert	.857
Competence/Autonomy	M1	8	1–7	7-point Likert	.842
Moral Orientation	M2	6	1–7	7-point Likert	.795
Sustainable Behavior	Y	13	1–5	5-point Likert scale	.891

Note: All scales were converted to z-scores prior to analysis.

4.2. Total effects: the value of learning and sustainable behavior

Before moving to the serial mediation model, the total effect of the value and meaning of learning on sustainable behavior (without mediators included in the model) was tested. The standardized regression coefficient,

- $X \rightarrow Y$ total effect (c): $\beta = .356$, $p < .001$, $R^2 = .126$ was obtained.

Through the interpretation framework by Cohen (1988), this value indicates effect size close to medium; approximately 13% of the variance in sustainable behaviour is accounted only through value and meaning of learning.

Overall, those students who considered learning as valuable and meaningful demonstrated greater sustainable and prosocial behavior. The impact is considerable, yet the classic value–action gap still remains: valuing sustainability-relevant learning makes one more likely to act, but it does not make one act in the guild of constraint.

4.3. Regression results of the serial mediation model

The serial mediation model was examined by estimating three regression equations predicting (1) competence/autonomy from learning value, (2) moral orientation from learning value and competence/autonomy, and (3) sustainable behavior from learning value, competence/autonomy, and moral orientation.

Table 2 display the standardized coefficients for the three regression equations.

Table 2. Regression results of the serial mediation model (standardized coefficients) (source: created by authors)

Dependent variable	Predictor	β	p	Model R^2
M1 (Competence)	Value of Learning (X)	.713	< .001	.508
	Controls	—	—	
M2 (Moral Orientation)	Value of Learning (X)	.298	< .001	.537
	Competence/Autonomy (M1)	.491	< .001	
	Controls	—	—	
Y (Sustainable Behavior)	Value of Learning (X)	.104	= .117	.180
	Competence/Autonomy (M1)	.284	< .001	
	Moral Orientation (M2)	.076	= .247	
	Controls	—	—	

Note: Detailed coefficients for control variables are not included in the table; they were controlled for together in all models.

According to H1(X to M1), learning's value and meaning has a very strong, positive effect on competence/autonomy ($\beta = .713, p < .001$). The formula accounts for 51% of variance of competence/autonomy ($R^2 = .508$). The finding supports H1 showing greater perceived competence and autonomy in students who find learning valuable.

H2 (M1 \rightarrow M2): Looking at the moral orientation equation, both the value of learning ($\beta = .298, p < .001$) and competence/autonomy ($\beta = .491, p < .001$) seem to be significantly related with moral orientation. About 54% of the variance in moral orientation is explained by the model ($R^2 = .537$). This table demonstrates that students who view the value of learning as high and feel competent, see learning as a means to impact positively on others and the planet. Hence, H2 is supported.

H3 (M2 \rightarrow Y): When all predictors were entered simultaneously, competence/autonomy significantly predicted sustainable behavior ($\beta = .284, p < .001$), whereas moral orientation did not ($\beta = .076, p = .247$). The direct effect of learning value on sustainable behavior decreased to non-significance ($\beta = .104, p = .117$), indicating that the relationship is carried primarily by the indirect pathways, especially competence/autonomy.

When the findings are evaluated together, it is seen that the serial model operates particularly through the competence/autonomy channel; moral orientation, on the other hand, acts more as a component of the motivational architecture, but not as a component directly linked to behavior.

4.4. Indirect effects: centers of gravity of the motivational bridge

Indirect and total effects were assessed using 95% confidence intervals obtained through 1,000 bootstrap resampling. Standardized indirect effect coefficients and confidence intervals are summarized in Table 3. Effect-size interpretation followed recommended mediation reporting practices (Preacher & Kelley, 2011).

As shown in Table 3:

- The indirect effect through competence/autonomy (X \rightarrow M1 \rightarrow Y) is significant and close to a medium effect size ($\beta = .202, 95\% \text{ CI } [.109, .291]$). This indi-

cates that students who perceive the value of learning as high exhibit more sustainable behavior because they feel more competent and autonomous.

- The indirect effect via moral orientation alone (X \rightarrow M2 \rightarrow Y) is not significant ($\beta = .023, \text{ CI includes zero}$). Similarly, the confidence interval for the full motivational chain (X \rightarrow M1 \rightarrow M2 \rightarrow Y) also includes zero ($\beta = .027$). Therefore, it can be said that H4 – the serial transfer of the competence/autonomy effect to sustainable behavior via moral orientation – is not directly supported by this dataset.
- The total indirect effect is significant ($\beta = .251, 95\% \text{ CI } [.163, .341]$) and is driven mainly by the competence/autonomy pathway rather than the moral-orientation pathways.
- With mediators included, the direct effect of learning value (c') is reduced compared with the total effect (c), consistent with mediation through competence/autonomy.

In summary, the findings can be interpreted as follows in terms of the hypothesis set:

- H1 and H2 are strongly supported; the value of learning fosters both competence and moral orientation, and competence is a strong predictor of moral orientation.
- H3 is not supported; moral orientation does not show a meaningful direct relationship with sustainable behavior in the model.
- The serial mediation dimension of H4 (M1 \rightarrow M2 \rightarrow Y) is not supported, but the direct effect of competence on sustainable behavior is strongly confirmed.
- H5 is supported in terms of learning's value creating a meaningful total indirect effect, particularly through competence/autonomy; the contribution of moral orientation is marginal in this model.

In short, the pattern supports a competence-centered bridge from learning value to action: valuing learning matters most when it is coupled with felt capability and autonomy.

5. Discussion and conclusions

This section interprets the results and outlines implications, limitations, and future research.

Table 3. Indirect, direct, and total effects of the value of learning on sustainable behavior (source: created by authors)

Effect pathway	Effect type	β (standardized)	95% Bootstrap CI	Comment
X \rightarrow M1 \rightarrow Y	Indirect (competence pathway)	.202	[.109, .291]	Meaningful
X \rightarrow M2 \rightarrow Y	Indirect (moral route)	.023	[-.018, .060]	Not significant
X \rightarrow M1 \rightarrow M2 \rightarrow Y	Serial indirect (full chain)	.027	[-.020, .071]	Not significant
Total indirect (X \rightarrow M1/M2 \rightarrow Y)	Indirect (all paths)	.251	[.163, .341]	Significant
X \rightarrow Y (including mediators)	Direct (c')	.104	[.000, .235]	Close to the threshold
X \rightarrow Y (excluding mediators)	Total effect (c)	.356	[.265, .446]	Significant

Note: CI indicates the confidence interval; if the confidence interval does not include zero, it indicates that the effect is significant at the $p < .05$ level (Fritz & MacKinnon, 2007).

From value to competence: The center of gravity of the motivational chain

A strong association was evidenced between competence/autonomy ($\beta = .713$) and valuing learning. This finding is consistent with expectancy–value and SDT accounts in which valuing an activity contributes to effort, engagement and mastery (Eccles & Wigfield, 2002; Deci & Ryan, 2000).

Most importantly, the indirect pathway that dominates value of learning competence/autonomy sustainable behavior ($\beta = .202$). This implies that value is primarily translated in this sample into action through a felt ‘I can do it’ capacity, which is consistent with perceived behavioural control as an important condition for intention translation into action (Ajzen, 1991).

The overshadowing of moral orientation: Taking a negative finding seriously

A second finding is that moral orientation does not directly predict sustainable behavior once competence/autonomy is included. While moral orientation is associated with learning value and competence, it does not carry the final step to behavior in this model.

Prior research often links moral identity or environmental self-identity to pro-environmental behavior, but these links are heterogeneous. Meta-analytic work suggests that perceived control, habits, and situational opportunities explain large portions of variance in routine behaviors, whereas identity and values become more salient for costly, identity-relevant, or socially visible actions (Bamberg & Möser, 2007; Klöckner, 2013; Gifford & Nilsson, 2014).

Two interpretations are plausible. First, our moral-orientation measure reflects a broad prosocial purpose rather than a domain-specific environmental identity, and identity–behavior links tend to strengthen when identity content closely matches the behavior domain (van der Werff et al., 2013; Wild & Heuling, 2024). Furthermore, considering daily low-cost actions, competency and perceived control may act as a binding constraint on action, in line with value–action gap accounts stressing efficacy and structural barriers (Ajzen, 1991; Blake, 1999). This corresponds with Value–Belief–Norm theory that values are distal drivers that still need enabling norms and perceived ability to become action (Stern, 2000).

As a whole, the insignificant M2→Y path should not be read as “morality does not matter”; it reveals that moral purpose alone often proves insufficient without actionable skills, autonomy, and opportunity.

One method of reconciling this pattern with moral-psychology perspectives is to treat moral orientation as a distal frame rather than a proximal driver. Ethical discourse reviewed in the systematic review leads to the understanding that moral arguments can shape intentions as well as self-perceptions, yet enacted behaviour strongly depends on habits, situational affordances and institutional supports (Shrestha et al., 2025).

The ethical condition at school may affect whether moral motives are acting or not. Studies on ethical climate

in the higher education sector show that leadership, cohesion and moral efficacy shape perception about what is supported or rewarded behaviour (Din et al., 2025; Vidak et al., 2020). The weak moral path in the present model may be moderated by such contextual factors.

Implications for higher education: More than “teaching the right values”

The findings relate to debates about sustainability education in higher education. Policy frameworks position universities as sustainability change agents. However, the implementation often tails off to content and values rather than to the competence/autonomy conditions for behaviour (United Nations, 2015; UNESCO, 2020b).

According to the study, it is the bridge between competence / autonomy and the value of learning, which is a key to engage in sustainable behaviour. In this context, three basic recommendations arise for higher education programmes.

1. Incorporate sustainability in regular curricula through assignments and projects where students can design, test and see outcomes – “this matters” + “I can do this” (Barth & Rieckmann, 2016; UNESCO, 2020a).
2. Creating a learning structure that provides meaningful choices, scaffolded challenges and mastery feedback. When autonomy support is not structured it can be overwhelming. Structured autonomy fosters greater agency and persistence in sustainability-related action.
3. One method for enhancing the moral grounding of students is to connect learning with one’s discipline and one’s discipline’s dilemmas – for instance, business students could consider the ethics of supply chains, engineers, the life-cycle analysis, etc. This ensures that the moral purpose is complemented by role relevant competence (Ones & Dilchert, 2012; Glavas, 2016).

University designs that strengthen their competencies and their profession-specific moral identities can enhance the “transferability” of sustainable behaviours when students make the transition to working life.

Implications for organizational ethics and sustainability culture

Although conducted with students, the results inform organizational ethics and sustainability culture. Corporate sustainability depends on employee environmental citizenship behaviour, which in organisations promoted by favourable climates and capabilities, pro-environmental behaviour is feasible (Boiral, 2009; Luu, 2019; Liu & Qi, 2022).

The complementary insight provided by the “value → competency → behavior” chain through the study further enhances this framework.

- Universities can improve graduates’ sustainability competence and autonomy, which makes graduates

more likely to initiate and maintain OCBE-like behaviour in organisations.

- Organizations can further strengthen this by making resources available and giving employees the freedom to make decisions and feedback systems that keep them feeling competent and in control of their sustainable efforts.
- The combination of ethical leadership and CSR programs is likely to be more effective when integrated with actual skill-building and autonomy-supportive work design rather than just messaging according to Brown et al. (2005) and Brown and Treviño (2006).

According to this, there is an “ethical supply chain” that exists between the world of higher education and that of organizations wherein universities develop our motivational capacities and organizations provide the structural opportunities and structures that convert that capacity into practice.

Limitations and future research directions

The findings of this study should be viewed taking into account some limitations.

First, the cross-sectional design limits causal inference. There is a need for longitudinal studies and experimental course or program interventions to test whether changes in the learning value and competence/autonomy precede changes in sustainable behaviour.

Measures were self-reported, possibly inflating associations. The addition of behavioral indicators or multi-source reports in future work, where feasible, should be recommended.

In the third place, moral orientation was measured as a general prosocial purpose rather than an environmental self-identity. Future research can test specific identity measures for each domain and see if moral pathways strengthen for high-cost or identity-relevant behaviors.

In the end, limited generalizability arises, both from the single-country student sample and a modest set of covariates. Through the use of replication in different contexts or adopting a multilevel design, it might be easier to untangle motivational mechanisms from structural barriers.

Conclusion: Values speak, competencies walk

This study presents a serial mediation model testing how students' perceptions of the value and meaning of learning in a higher education context are linked to sustainable and prosocial behavior through the channels of competence/autonomy and moral orientation. The findings point to three main conclusions:

The value of learning strongly nourishes students' feelings of competence and autonomy, which form a fundamental motivational source for sustainable behavior.

Although moral orientation is strongly linked to the value of learning and competence, it did not directly predict sustainable behavior in this sample; perceived competence and control appear to be dominant, especially when it comes to low-cost daily behaviors.

Much of the relationship between the value of learning and sustainable behavior operates indirectly through competence/autonomy; the main bridge closing the value–action gap is the feeling of “I can do it.”

Novelty and contributions. The study isolates competence/autonomy as the dominant pathway from learning value to sustainability-oriented behavior and shows that a general moral orientation adds little incremental prediction once competence/autonomy is considered. Practically, the results suggest that both universities and employers should invest less in value messaging alone and more in autonomy-supportive, competence-building experiences linked to real sustainability tasks.

In short, values matter most when supported by conditions for action. Sustainable futures require both moral purpose and the competencies and autonomy that make acting possible.

Author contributions

MRU and GS created study design, MRU collected and analyzed the data, GS developed literature review, MRU wrote initial manuscript, MRU and GS finalized the article.

Disclosure statement

Authors declared that there is no conflict of interest.

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Appendix A

Control variables. Religiosity/spirituality, course presentation format, and time allocated to volunteer activities were included as covariates in all regression equations to partial out alternative explanations related to values-based orientation and action opportunities. The focal pattern of results for learning value, competence/autonomy, and moral orientation remained substantively unchanged with these covariates included.

Multicollinearity diagnostics. Because learning value, competence/autonomy, and moral orientation are conceptually adjacent, their overlap was inspected through zero-order correlations and variance inflation factors (VIF). The correlations among the focal predictors were strong (approximately $r = .65-.71$). In the sustainable behavior equation, VIF values for the focal predictors were approximately 2.2–2.6, suggesting moderate overlap but no problematic multicollinearity.