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Bridging Beliefs and Behavior: How Self-Efficacy and Learning Efforts Translate Locus of Control into Academic Performance

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This study investigates how locus of control (LoC) influences academic performance indirectly through a sequential mediation by self-efficacy and learning efforts. The UNiDOS study was conducted in November-December 2024 using an online survey via email invitations with LimeSurvey software. A total of 1219 second-year and older students from Taras Shevchenko National University of Kyiv were included in analysis. To examine how self-efficacy and learning efforts mediate the relationship between LoC and academic performance, we applied a SEM model, which demonstrated a good fit. While the direct path from internal LoC to average grades was insignificant, the indirect pathway "LoC – self-efficacy – learning efforts – academic performance" was significant. Those with a greater internal locus of control develop stronger self-efficacy, which leads to greater learning efforts and translates into better performance. The key study limitations include the cross-sectional design, the reliance on self-reports to measure learning efforts and the non-representative sample. Future research employing longitudinal or experimental designs, incorporating objective effort metrics, and examining potential moderators, such as field of study or academic year, is needed. Overall, our results underscore the importance in the learning process of both students' confidence in their abilities when tackling tasks and the effort they put in. This helps bridge the gap between students' potential and their academic achievements.

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Key words: locus of control, academic performance, self-efficacy, learning efforts, SEM model.

Москотіна Руслана. Поєднання переконань та поведінки: як упевненість у собі й навчальні зусилля перетворюють локус контролю на академічну успішність. У цій публікації розглянуто, як локус контролю опосередковано впливає на академічну успішність через послідовну медіацію впевненості в собі та навчальних зусиль. Використано дані дослідження UNiDOS, котре проводилося в листопаді-грудні 2024 р. за допомогою онлайн-опитування в LimeSurvey. Посилання на опитування розсилалося на електронні адреси студентів. Аналіз даних проводили для 1219 студентів другого курсу і старше Київського національного університету імені Тараса Шевченка. Щоб з'ясувати, як упевненість у собі й навчальні зусилля опосередковують зв'язок між локусом контролю та академічною успішністю, ми застосували SEM модель; вона продемонструвала хорошу відповідність даним. Прямий ефект локусу контролю на успішність виявився статистично незначущим, а опосередкований (локус контролю – упевненість у собі – навчальні зусилля – академічна успішність) був значущим. Чим більш інтернальним є локус контролю, тим сильніша впевненість у собі. Остання сприяє вищим навчальним зусиллям, що, урешті, приводить до кращих академічних результатів. Основні обмеження дослідження включають кроссекційний дизайн, вимірювання навчальних зусиль через самооцінку їх студентами та нерепрезентативність вибірки. У подальших дослідженнях потрібно використовувати лонгітюдний або експериментальний дизайн, ураховувати об'єктивні метрики для вимірювання навчальних зусиль, виявляти потенційні модератори, наприклад спеціальність чи курс навчання. Загалом, наші результати підкреслюють важливість у навчальному процесі як упевненості студентів у своїх силах під час виконання завдань, так і докладених зусиль. Це сприяє подоланню розриву між потенціалом студентів та їхніми академічними досягненнями.

Ключові слова: локус контролю, академічна успішність, упевненість у собі, навчальні зусилля, SEM модель.

INTRODUCTION

Why do some students spend endless hours studying only to come up short, while others sail through exams with seemingly minimal effort? What inspires one learner to work hard, but leaves another equally capable student unmotivated? And why do even the most gifted students sometimes fail a test that their less gifted peers pass it successfully? These paradoxes cannot be explained by ability or hours alone; rather, they reflect how students' underlying beliefs and personality traits shape the way they interpret challenges and manage their efforts.

To see how this works in practice, consider one of the most widely studied belief systems – locus of control (LoC), first proposed by Rotter (1966), which reflects whether individuals perceive life outcomes as the result of their own actions (internal LoC) or as determined by external forces (external LoC). People with an internal LoC tend to take proactive steps to change their circumstances or achieve their goals, whereas those with an external LoC are more likely to attribute outcomes to chance, fate, or other people. This construct applies to all domains of life, including educational achievement. A growing body of research has demonstrated a positive relationship between an LoC and students' academic performance. Findley and Cooper's (1983) literature review showed that in most studies greater internality associated with better academic achievement and the magnitude of this correlation ranges from small to moderate. However, some hypothesis tests resulted in a negative correlation or did not support the existence of the relationship between LoC and academic performance. These mixed results were shown in the latter research. Some prove the positive relationship between LoC internality and academic performance of students (Carden et al., 2004; Ghasemzadeh, & Saadat, 2011; Li et al., 2015). Other studies found no relationship between LoC and academic achievement (Suphi, & Yaratan, 2011; Apriyanti, & Wardoyo, 2022) or showed that higher internality is associated with lower grade point average (GPA) (Althubaiti et al., 2024).

Indeed, these mixed findings underscore the need not only for more rigorous evaluation of research methodologies, but also for a closer examination of the mechanisms by which LoC exerts its influence on academic outcomes. Beliefs alone do not produce academic performance: simply believing that one's actions determine outcomes does not automatically improve grades. Consequently, studies of academic achievement should take into account not only perceptions of life outcomes, but also self-efficacy, the concept developed by Bandura (1977), which in educational settings refers to the self-confidence in mastering learning tasks[1] (Alias et al., 2016). Both LoC and self-efficacy deal with how much control we feel we have over life's events, but they differ in focus. LoC describes whether we generally see outcomes as driven by our own actions or by outside forces, and applies to most areas of life, while self-efficacy is about how confident we are in our ability to achieve a particular goal, and focuses on specific tasks (Au, 2014). Thus, we theorise that individuals with an internal LoC tend to have stronger self-efficacy because attributing outcomes to their own efforts increases their confidence in coping with new challenges. Empirical studies support this link between LoC and self-efficacy for students (Sagone, & De Caroli, 2014; Drago et al., 2016; Bahçekapılı, & Karaman, 2020; Kader, 2022).

Moreover, stronger self-efficacy leads students to invest more effort in learning, which in turn enhances academic performance (Alias et al., 2016). This pattern aligns with the Bandura's self-efficacy theory (Bandura, 1977), which posits the crucial role of the self-efficacy in a person's behaviour and the outcome of their efforts. Learning efforts are correlated positively with both self-efficacy (Li, 2012; Alias et al., 2016; Komarraju, & Nadler, 2013) and academic performance (Diseth et al., 2009; Goodman et al., 2011; Li, 2012). It is also important to distinguish between objective measures of effort and students' perceptions of their effort – only the latter appears to have a direct influence on academic success (Dunlosky et al., 2020).

However, the role of the self-efficacy and learning efforts as sequential mediators of the LoC-academic performance relationship remains underexplored. Typically, the mediation of these variables has been tested separately. Komarraju and Nadler (2013) found that effort regulation partially mediates the link between self-efficacy and GPA. Yongmei and Chen (2023) examined the mediating effect of academic self-efficacy on the relationship between LoC and learning adaptability[2] and likewise reported partial mediation. Yet,

[1] In studies of students' academic performance this concept sometimes referred to as "academic self-efficacy".

[2] Learning adaptability is not the same as learning efforts. However, it also refers to students' behaviour that predicts how carefully they will do the tasks and their learning outcomes.

there is a lack of studies that have fully mapped the pathway "locus of control – self-efficacy – learning efforts – academic performance". However, understanding the sequential mediation of self-efficacy and study effort is crucial as it sheds light on how beliefs and attitudes are translated into action. It is not enough to believe in the ability to successfully complete a task, one should also put in the effort to achieve the desired outcome.

Building on the existing evidence, this study ***aims*** to examine whether locus of control influences academic performance indirectly through a sequential mediation by self-efficacy and subsequent learning efforts.

1. METHODOLOGY

1.1. Theoretical Model

In this study, we test the theoretical model presented in fig. 1. Based on prior evidence and theoretical reasoning, we hypothesise that locus of control does not directly influence the academic performance. Simply believing that outcomes depend on one's own actions does not determine our successes and failures. However, our underlying views and attitudes shape our behaviour and the effort we put in – and these, in turn, influence the results we achieve. Therefore, we propose an indirect pathway: students with a more internal locus of control are more likely to develop stronger self-efficacy beliefs. These beliefs, in turn, lead to greater investment in learning efforts, which enhance academic performance.

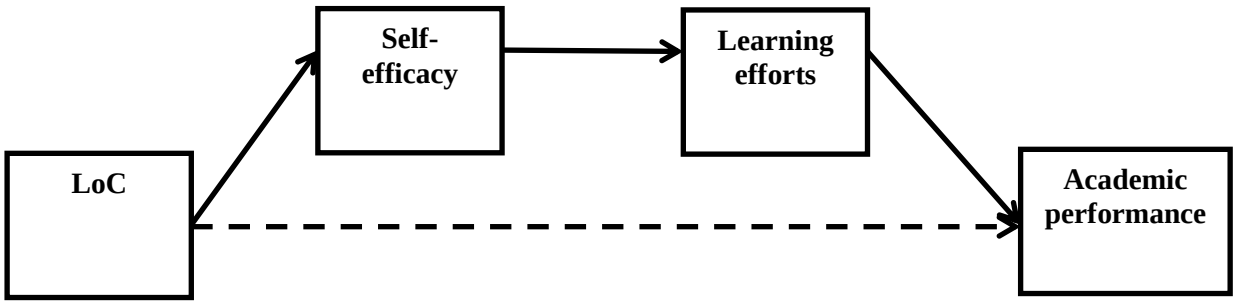

Fig. 1. *Theoretical Model of the Relationship between the LoC and Academic Performance*

Note: *a dotted line indicates that there is no association between the variables, while a solid line indicates that there is.*

Source: *compiled by the author.*

1.2. Measures

Locus of Control. It was included as an independent variable in our model. We measured LoC with 7 items from Pearlin and Schooler's (1978) personal mastery scale. This scale assess an individual's perceived ability to influence events in their life (e.g., *"I have little control over the things that happen to me"*, *"I often feel helpless in dealing with the problems of life"*). Respondents rated each statement on a 4-point Likert scale (1 = strongly disagree, 4 = strongly agree). All items were carefully translated into Ukrainian and showed good internal consistency (Cronbach's α = 0,72). Two items were reverse coded and their scores were inverted. Thus, for all seven items, higher values indicate greater perceived control. We calculated the index based on seven items by taking the mean of each respondent's responses to these statements. The index scores range from 1 to 4, the higher values reflect stronger internality.

Self-efficacy and learning efforts. These constructs served as mediators between locus of control and academic performance. Each was measured with four items, rated on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). The items on the self-efficacy refers to students' confidence in their ability to succeed in academic tasks and to overcome learning challenges:

1. I am confident that I can overcome any difficulties that arise during the learning.
2. I am convinced that I can successfully complete any academic task.
3. I am able to quickly adapt to new challenges and demands related to my studies.
4. I am confident that I can learn effectively even under difficult or stressful conditions.

Learning efforts refer to the subjective assessment of diligence and responsibility that students apply when completing academic tasks and consist of following statements:

1. I consider myself a diligent student
2. I always try to give my all when completing academic assignments and projects
3. Once I start an academic assignment or project, I follow it through to the end
4. I exert as much effort at the end of an academic task as I do at the beginning

Self-efficacy and learning efforts items have a high internal consistency (Cronbach's α equals 0,89 and 0,84 respectively). We computed two indices – self-efficacy and learning efforts – by averaging respondents' scores on four items each. Both indices range from 1 to 5. Higher index values indicate greater self-efficacy or stronger learning efforts, respectively.

Academic Performance. This is a dependent variable was measured with a single question: "*Please indicate the range in which your average grade for the previous semester falls*". Respondents chose one of three answer options: 1 = 60-74, 2 = 75-89, 3 = 90 and more. They were instructed to base this average score on all credit tests, examinations, coursework assignments, and practicums, excluding any bonus points awarded by the Student Parliament.

1.3. Empirical Data

The aforementioned variables were included in the 20th wave of the UNiDOS study (November-December 2024), conducted among students at Taras Shevchenko National University of Kyiv. This was done to test the theoretical model presented in Fig. 1. A total of 2893 2nd year and older students participated. Respondents were randomly assigned to receive one of two versions of the questionnaire: Questionnaire A (sent to half of the sample) and Questionnaire B (sent to the remaining half). Questionnaire A included items on self-efficacy and learning efforts, while both versions contained the academic performance item – administered to all participants except first-year master's students. Therefore, our sample comprised 1252 respondents. We then removed students of the 222 "Medicine" specialty, a small, highly specialised cohort consisting solely of master's students, making cross-specialty comparisons inappropriate. Thus, the final sample consisted of 1219 2nd year and older students of the 21 faculties of the university.

The survey was carried out online using LimeSurvey software via email invitations. Student email addresses were officially provided by faculty coordinators and were not shared with third parties. Invitations were sent through the LimeSurvey platform; non-respondents or those with incomplete responses received follow-up reminders. All data was collected anonymously, preventing linkage of students' responses to specific email addresses.

1.4. Data Analysis

In this study we use several methods of data analysis. First, we calculated descriptive statistics for mediators, independent and dependent variables. Secondly, we used Spearman's correlations between the aforementioned variables, computed with the "ggstatsplot" package (Patil, 2021) in R. To account for multiple comparisons, we applied the Benjamini-Yekutieli correction. Finally, we utilized structural equation modeling (SEM). SEM was carried out using the "lavaan" package (Rosseel, 2012) in R. The structure of the model is shown in fig. 3. To assess the quality of SEM model, we applied goodness-of-fit indices: CFI, TLI, RMSEA, and SRMR. Kyndt and Onghena (2014) highlight that the SEM model has an acceptable fit when CFI and TLI > 0,9, RMSEA and SRMR < 0,08. Because academic performance was considered as an ordered variable, we used the DWLS estimator.

2. RESULTS

Table 1 presents descriptive statistics for variables included in the SEM model. Overall, students showed a predominantly internal locus of control and reported relatively high levels of self-efficacy. They also evaluated their learning efforts positively and achieved high average grades last semester. 42,0 % of respondents achieved an average grade of 90 or higher, 47,7 % scored between 75 and 89, and only 10,2 % fell in the 60–74 range.

Spearman's correlations revealed significant associations between almost all variables; only the relationship between LoC and academic achievement remained insignificant (see fig. 2)[1]. LoC correlated more strongly with self-efficacy than with learning efforts, whereas academic performance was more

[1] However, when we apply other adjustment methods (e.g., the Holm or Benjamini-Hochberg correction), the correlation between locus of control and academic performance becomes statistically significant, albeit very weak.

strongly linked to learning efforts than to self-efficacy. The highest correlation was observed between self-efficacy and learning efforts.

Table 1

Descriptive Statistics for Key Variables

Variable	All Respondents (N = 1219)
LoC	
Mean (SD)	2,83 (0,46)
Missing	*221*
Self-efficacy	
Mean (SD)	3,78 (0,97)
Missing	*558*
Learning efforts	
Mean (SD)	3,98 (0,82)
Missing	*558*
Academic performance	
60-74	72 (10,2 %)
75-89	336 (47,7 %)
90 and more	296 (42,0 %)
Missing	*515*

Note: *we applied valid percentages to the academic performance variable. For other variables, we computed means and standard deviations (in brackets).*
Source: *compiled by the author.*

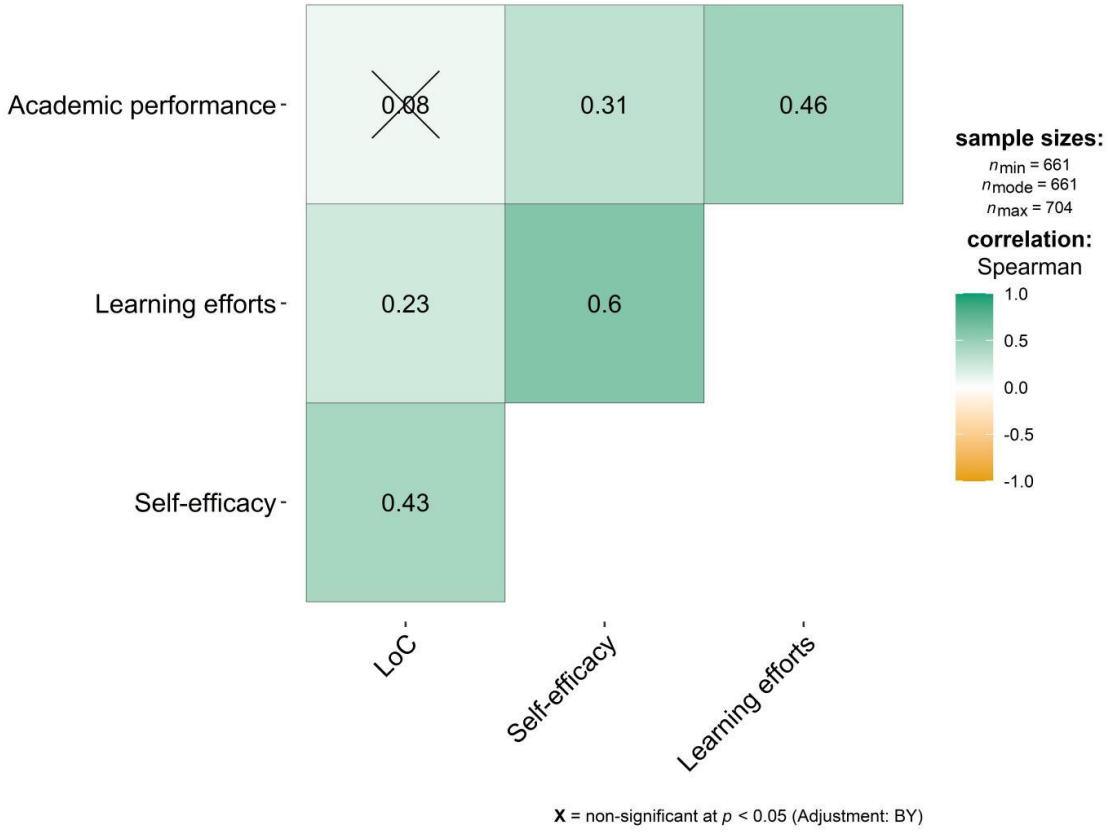

Fig. 2. *Spearman's Correlations between the Key Variables*
Source: *compiled by the author.*

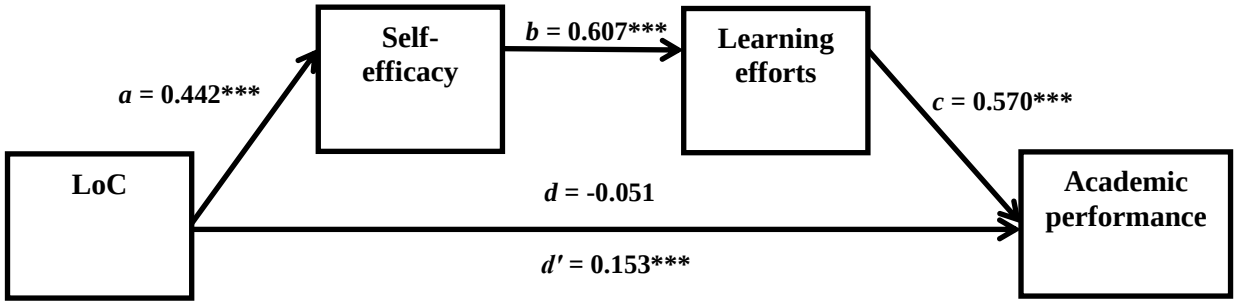

Fig. 3. *SEM Model of the Relationship between the LoC and Academic Performance*

Note: *there are standardised coefficients along each arrow. Path d represents the direct effect of LoC on academic performance, while path d′ denotes the indirect effect mediated by self-efficacy and learning efforts.*

*** $p < 0{,}001$

Source: *compiled by the author.*

The SEM model (see fig. 3) demonstrates a good fit to empirical data, with CFI = 0,999, TLI = 0,998, RMSEA = 0,018, SRMR = 0,020. The direct effect of LoC on academic performance is not significant. However, we observed a significant indirect effect: more internal LoC linked with better academic achievement. Greater internality is associated to higher self-efficacy; in turn, stronger self-efficacy leads to increased learning efforts, and these enhanced efforts lead to better academic performance.

3. DISCUSSION AND CONCLUSIONS

The results of our study suggest that the relationship between LoC and academic performance cannot be understood simply by examining each construct in isolation. Although the direct path from an internal locus of control to average grades was nonsignificant, the sequential mediation model revealed that students who believe they can influence life outcomes develop stronger self-efficacy, which in turn leads to greater learning efforts and translates into better performance.

From a theoretical perspective, these findings bridge Rotter's (1966) conception of locus of control with Bandura's self-efficacy framework by demonstrating how broad control beliefs shape the motivational processes that drive results (academic achievement). Whereas prior research have examined only isolated links – either between internality and self-efficacy (Sagone, & De Caroli, 2014; Drago et al., 2016) or between self-efficacy, study effort, and performance (Komarraju, & Nadler, 2013) – our model is among the first to map the full "LoC – self-efficacy – effort – academic performance" sequence.

Practically, these results suggest that interventions should target the cultivation of students' confidence in specific academic tasks and their ability to regulate effort. For example, if students are taught to see failures as things they can control and are helped to set goals, plan their time, and track their progress, they achieve better and longer-lasting results than if they only learn memorisation techniques.

Nevertheless, our reliance on cross-sectional data limits the strength of causal inferences. Future work should use longitudinal or experimental designs to establish causality. As we used an online survey, our sample does not represent all Ukrainian students or those at the Taras Shevchenko National University of Kyiv. In order to disentangle perception from behaviour, it would be also valuable to apply not only self-reported measures of learning efforts, but also incorporating objective measures of effort (e.g., learning management system analytics). Finally, investigating potential moderators – such as field of study, year of study – could reveal for whom the sequential mediation pathway is strongest.

In general, our study underscores the need for holistic educational strategies that address both the cognitive and behavioral dimensions of learning. Helping students to see outcomes as within their control, to feel confident in their abilities, and to sustain purposeful effort may be the key to closing the gap between potential and performance.

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