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# The Influence of Extrinsic Learning Motivation on Vocational Students' Learning Motivation: A Study of Regulation Types

**Zhong Yan, Marlissa Omar*, Fathiyah Mohd Kamaruzaman and Mohamad Sattar Rasul**
Faculty of Education
Universiti Kebangsaan Malaysia, Malaysia

**Abstract.** Focusing on extrinsic motivation in vocational education, this study examined the differential effects of three organismic integration theory constructs—external, introjected, and identified regulation-on learning motivation. Utilizing a cross-sectional survey design, the study collected data from a sample of 509 vocational students majoring in nursing and computer science. The data were gathered from vocational schools located in five different regions of Sichuan Province in China, using stratified random sampling to account for urban-rural disparities. A structured questionnaire, adapted from validated scales (e.g., academic motivation scale), measured students' extrinsic regulation types (independent variable) and their learning motivation levels (dependent variable). The results indicated that, while all three regulation types positively correlated with students' learning motivation, identified regulation (e.g., goal internalization) exerted the strongest influence on students' achievement, whereas external regulation (e.g., rewards or punishments) showed the weakest effect. Notably, vocational training's career-aligned structure amplified internalization, contrasting with general education models which prioritize external rewards. These insights advocate pedagogical strategies that integrate industry-relevant goal personalization to nurture value-congruent motivation.

**Keywords:** learning motivation; vocational; regulation types

## 1. Introduction

Learning motivation is an important factor affecting students' academic success, especially in the vocational education environment. As vocational education becomes increasingly significant in providing skilled professionals to meet the demands of the labor market, understanding the factors that drive students in these programs is crucial. Unlike traditional academic environments, vocational

*Corresponding author: *Marlissa Omar, marlissa@ukm.edu.my*

education often targets students with specific career goals and, hence, the motivations for learning in this context can be distinctly different (Ari & Sri, 2017; Martini et al., 2023).

Vocational education students are primarily oriented towards acquiring the practical skills and knowledge that directly correlate with their future employment opportunities. This pragmatic approach to learning means that their motivations are often linked to tangible outcomes such as job security, career advancement, and financial stability. In such settings, the role of extrinsic motivation becomes paramount. Extrinsic learning motivation is particularly critical in the vocational student group because these students are often driven by external factors such as future career prospects and economic income (Bartram, 2016).

Research indicates that vocational students face stronger external pressures compared to their peers in more traditional academic tracks (Yun et al., 2021). These pressures include economic factors, the need for timely completion of studies to enter the job market, and the direct application of their skills to prospective jobs (Zhu & Dizon, 2024; Ludwig-Mayerhofer et al., 2019). Thus, it is crucial to delve deeper into how these external pressures shape their motivation to learn and perform academically. The impact of extrinsic learning motivation on these students can provide valuable insights into their academic behaviors and outcomes. Compared with conventional students, vocational students face stronger external pressure, which makes it particularly important to study the impact of extrinsic learning motivation.

Although numerous studies have investigated various aspects of learning motivation in different contexts, there are relatively few studies on vocational students. The extrinsic learning motivation of vocational students is driven by external factors, such as future job opportunities and economic returns, so it is particularly important to understand their specific extrinsic learning motivation mechanisms (Zaccone & Pedrini, 2019). However, current research pays little attention to how different regulatory modes of extrinsic learning motivation affect vocational students' learning motivation. This provides an opportunity for further research. To address this gap in the literature, this study investigated how the three regulatory modes of extrinsic learning motivation—external regulation, internal regulation and identified regulation—affect the learning motivation of vocational students.

This study not only provides a new perspective for understanding the learning motivation of vocational students but also offers practical suggestions for the curriculum design of vocational education. Grounded in the organismic integration theory (OIT), a subtheory of the self-determination theory (SDT) (Ryan & Deci, 2020a), this study specifically examined three forms of extrinsic motivation—external regulation (behavior driven by rewards/punishments); introjected regulation (action motivated by internal pressures, such as guilt); and identified regulation (goal pursuit aligned with personal values)—and their differential effects on students' engagement and academic performance. These

styles are positioned along OIT's continuum of internalization (Ryan & Deci, 2020a).

First, external regulation represents the least autonomous form, in which behavior is primarily driven by external contingencies, such as rewards, punishments, or compliance, with external demands (e.g., "I study because my teacher requires it") (Raufelder et al., 2016). Second, introjected regulation reflects a partial internalization process, in which behavior is motivated by internal pressures such as guilt avoidance or ego enhancement (e.g., "I study to avoid feeling ashamed") (Bieg et al., 2020). Third, identified regulation constitutes a more self-determined form, occurring when students personally value and accept the importance of a learning activity despite its extrinsic origin (e.g., "I study English because it is valuable for my future career") (Howard et al., 2021).

By distinguishing between these regulatory styles along the autonomy continuum, educators can design curricula and interventions that not only reduce students' reliance on purely external motivators but also strategically foster more internalized forms of motivation. Such efforts may ultimately enhance students' interest in learning and lead to improved academic outcomes in vocational education. Building upon previously reviewed literature, this study empirically examined how different forms of extrinsic learning motivation regulation impact the learning motivation of vocational students.

### 1.1 Study Hypotheses

To understand the role of external regulation, introjected regulation and identified regulation in the learning motivation of vocational students better, the research hypotheses were as follows:

H1: External regulation has a significant positive impact on vocational students' learning motivation.

H2: Introjected regulation has a significant positive impact on vocational students' learning motivation.

H3: Identified regulation has a significant positive impact on vocational students' learning motivation.

## 2. Literature Review

### 2.1 Theoretical Background

The SDT is one of the basic frameworks for the study of learning motivation. It divides motivation into intrinsic motivation and extrinsic learning motivation (Ryan & Deci, 2000). According to the OIT under the SDT, extrinsic learning motivation can be further divided into four types of regulation: external regulation, introjected regulation, identified regulation, and integrated regulation (Deci & Ryan 1985).

These regulation styles represent the process of individuals internalizing external goals to varying degrees. Among them, external regulation has the strongest externalities than other regulations and is mainly driven by external factors, such as external rewards and punishments (Garn et al., 2012; Raufelder et al., 2016; Taylor et al., 2014); introjected regulation reflects the internalization of external

pressures by individuals, such as acting to avoid guilt or gain recognition from others (Bieg et al., 2020; Ryan & Deci, 2020a); and identified regulation indicates that individuals have a high degree of identification with behavioral goals and combine them with personal values and goals (Deci & Ryan, 2009; Guay, 2022; Howard et al., 2021). Although integrated regulation is part of extrinsic learning motivation, it is very close to intrinsic motivation because individuals at this stage almost completely internalize external goals and integrate them with personal beliefs and values (Wilson et al., 2007).

In this study, we only selected three types of regulation: external regulation, introjected regulation, and identified regulation, and did not include integrated regulation. Integrated regulation is very closely related to intrinsic motivation (Wilson et al., 2007) and difficult to distinguish from intrinsic motivation in some cases, especially in the context of vocational education. It is difficult to measure with standard questionnaires (Vallerand et al., 1992) so it was therefore excluded from the scope of this study. Vocational students' motivation is often more affected by external factors such as career prospects and economic stability (Bartram, 2016).

This study focused on the three main types of regulation that are more directly related to external driving forces: external regulation, introjected regulation, and identified regulation. The learning motivation of vocational students differs from that of traditional students. At the same time, the identified regulation of vocational students is usually closely related to their expectations for future careers, which makes them show higher learning motivation during the learning process (Ratelle et al., 2007). Although existing studies have explored different ways of regulating learning motivation, there are relatively few empirical studies on vocational students. In particular, the role of internalized regulation and identified regulation in extrinsic learning motivation in vocational students has not been fully explored. Thus, this research offers a fresh outlook on vocational students' learning motivation by examining the three different forms of extrinsic learning motivation regulation.

**2.2 Research Questions**

Guided by OIT's framework, this study addressed the following questions:

RQ1: What is the relationship between external regulation and vocational students' learning motivation?

RQ2: How does introjected regulation associate with vocational students' learning motivation?

RQ3: To what extent does identified regulation influence vocational students' learning motivation?

**2.3 Research Objectives**

Grounded in OIT (Ryan & Deci, 2020a), this study primarily aimed to systematically compare the efficacy of three extrinsic motivation subtypes—external regulation (contingency-driven compliance), introjected regulation (guilt-based or pride-based effort), and identified regulation (value-aligned engagement)—in stimulating vocational students' multidimensional learning motivation. By quantifying their differential effects on behavioral (e.g., task

persistence), cognitive (e.g., strategy elaboration), and affective (e.g., career identity) engagement, the study directly tested OIT's core hypothesis that identified regulation, as an autonomous motivator, yields more robust and sustainable outcomes than controlled forms of regulation (Deci et al., 2017; Howard et al., 2021).

## 3. Methodology

### 3.1 Research Design

This study adopted a cross-sectional survey design, utilizing a structured questionnaire to collect quantitative data. The choice of a cross-sectional survey design allows for the efficient assessment of vocational students' learning motivation at a single point in time. This design is suited to measuring different aspects of extrinsic learning motivation regulation and its impact on students' learning motivation, as it provides a snapshot of the current state of these factors. The quantitative approach enables the analysis of patterns and relationships within the collected data, offering insights into how varying types of motivation regulation influence learning outcomes among vocational students.

In quantitative research, questionnaires are widely regarded as one of the most effective tools for collecting data from large sample sizes due to their efficiency, cost-effectiveness, and ease of standardization (Creswell, 2015). These instruments typically consist of structured questions and fixed response options, allowing for statistical analysis and comparison across groups. The Likert scale is a common format used in questionnaires, which enables the measurement of respondents' levels of agreement or frequency on a scale, often ranging from 1 to 5. Questionnaires are particularly well-suited for gathering information about attitudes, opinions, motivations, and behavioral frequencies (Dörnyei, 2007).

The reliability analysis of the prediction scale in this study uses the internal consistency coefficient (Cronbach α coefficient) analysis, which is a common analysis method to test the reliability of the scale measurement tool and the stability of the measurement results. To determine the reliability of the instrument, the reliability test used the Pearson sub-item correlation coefficient (item to total correlation) and Cronbach α value to test the internal consistency of each factor of the scale.

The anonymity of respondents was ensured through a two-step distribution process. First, the questionnaires were disseminated electronically to school counselors, then the school counselors randomly distributed them to students within relevant academic programs. The questionnaire collected the school's name and the students without personally identifiable information. This approach not only guaranteed that respondents met the target demographic criteria (i.e., students from the specified disciplines) but also preserved anonymity by eliminating direct contact between the researcher and respondents. Counselors acted as intermediaries, ensuring no identifiable information was shared with the research team.

### 3.2 Sampling

A stratified sampling method was used to select students from vocational colleges in Sichuan Province in China as respondents. The stratification was based on the students' grade, major and geographical location to ensure the representativeness of the sample. A total of 509 questionnaires were distributed and all valid responses were received.

Table 1 presents the demographic profile of the respondents, totaling 509 respondents. The majority of the respondents are nursing majors, accounting for 52.1%, while the remaining 47.9% are computer science majors. In terms of academic grade, 54.4% are in Grade 2, with the remaining 45.6% in Grade 1. About 35.2% of respondents serve as class leaders, while 64.8% do not hold this position. Gender distribution indicates that 64.2% are male and 35.8% are female. Regarding family location, most respondents come from rural areas (57.0%), with smaller proportions residing in towns (14.3%), counties (13.2%), and cities (15.5%). Parental education levels show that 73.5% of respondents' fathers have only completed junior high school, while 17.3% have finished high school, and a small percentage pursued higher education. Similarly, 80.2% of the respondents' mothers have a junior high school education, with fewer reaching higher levels. Household income varies, with 45.0% earning between 0 and 20,000RMB annually, and 20.8% of households fall in higher income bracket of 40,000RMB annually. The number of siblings also varies with 47.3% of respondents with two siblings, followed by 21.6% with one sibling, and smaller percentages having three or more siblings.

**Table 1: Sampling profiles**

| Demographic | Category | Frequency (n=509) | Percentage (%) |
|---|---|---|---|
| Major | Nursing major | 265 | 52.1 |
| | Computer science major | 244 | 47.9 |
| Grade | Grade 1 | 232 | 45.6 |
| | Grade 2 | 277 | 54.4 |
| Class leader | Yes | 179 | 35.2 |
| | No | 330 | 64.8 |
| Sex | Male | 327 | 64.2 |
| | Female | 182 | 35.8 |
| Family location | Rural area | 290 | 57.0 |
| | Town | 73 | 14.3 |
| | County | 67 | 13.2 |
| | City | 79 | 15.5 |
| Father's education level | Junior high school | 374 | 73.5 |
| | High school | 88 | 17.3 |
| | Junior college | 29 | 5.7 |
| | Undergraduate and above | 18 | 3.5 |
| Mother's education level | Junior high school | 408 | 80.2 |
| | High school | 76 | 14.9 |

| | | | |
|---|---|---|---|
| | Junior college | 16 | 3.1 |
| | Undergraduate and above | 9 | 1.8 |
| Household income | 0–20,000RMB/year | 229 | 45.0 |
| | 20,000–30,000RMB/year | 106 | 20.8 |
| | 30,000–40,000RMB/year | 68 | 13.4 |
| | Above 40,000RMB/year | 106 | 20.8 |
| Number of brothers and sisters | One brother or sister | 110 | 21.6 |
| | Two brothers or sisters | 241 | 47.3 |
| | Three brothers or sisters | 106 | 20.8 |
| | Four brothers or sisters | 52 | 10.2 |

### 3.3 Research Instrument

The questionnaire comprised of two parts: learning motivation and extrinsic learning motivation. The learning motivation part assessed the intrinsic and extrinsic learning motivation of higher vocational students. The scale was modified based on Schreglmann's academic motivation scale (Schreglmann, 2018), which included 10 items. Intrinsic motivation made up 5 items and 5 items were about extrinsic learning motivation (Table 2). Second, extrinsic learning motivation evaluated three extrinsic learning motivational modes: external regulation, internalized regulation, and identified regulation. The scale was adapted from Vallerand et al.'s (1992) academic motivation scale (AMS–C 28). It consisted of three sub-constructions: external regulation, introjected regulation, and identified regulation. Each sub-construction had five items. All items used a 5-point Likert scale, from "strongly agree" to "strongly disagree", to assess students' motivation levels.

**Table 2: Items of constructs**

| Second order construct | First order construct | No of items |
|---|---|---|
| Learning motivation | Intrinsic motivation (IM) | 5 |
| | Extrinsic motivation (EM) | 5 |
| Extrinsic learning motivation | External regulation (ER) | 5 |
| | Introjected regulation (INR) | 5 |
| | Identified regulation (IDR) | 5 |

### 3.4 Validity and Reliability Assessment

Discriminant validity was assessed using the heterotrait-monotrait ratio of correlations (HTMT). According to Hair et al. (2019), a HTMT value below 0.9 indicates sufficient discriminant validity. As evident in Table 3, the results show that the HTMT values for all constructs are below 0.9, except for the relationship between extrinsic motivation (EM) and intrinsic motivation (IM). Further bootstrapping confirmed that the HTMT values were significantly different from 1 (90% confidence interval of HTMT does not include the value of 1), thereby supporting the discriminant validity of the constructs.

**Table 3: HTMT values**

| | EM | ER | ELM | IDR | IM | **INR** | LM |
|---|---|---|---|---|---|---|---|
| EM | | | | | | | |
| ER | 0.733 | | | | | | |
| ELM | 0.844 | – | | | | | |
| IDR | 0.816 | 0.800 | – | | | | |
| IM | **0.923** | 0.667 | 0.782 | 0.799 | | | |
| INR | 0.833 | 0.848 | – | 0.883 | 0.738 | | |
| LM | – | 0.714 | 0.829 | 0.825 | – | 0.801 | |

Note: Bold values indicate HTMT > 0.9
EM = Extrinsic learning motivation; ER = External regulation; ELM = Extrinsic learning motivation; IDR = Identified regulation; IM = Intrinsic motivation; INR = Introjected regulation; LM = learning motivation

The reliability of each construct was evaluated using composite reliability (CR). All constructs' CR values surpassed 0.7, confirming that internal consistency was at a satisfactory level (Hair et al., 2019). Additionally, convergent validity was assessed by the average variance extracted (AVE) values. According to Table **4**, all the AVE values were above 0.5, demonstrating that the constructs explained more than 50% of the variance among the indicators (Hair et al., 2019).

**Table 4: Construct reliability and validity**

| **Second order construct** | **First order construct** | **CR (≥0.7)** | **AVE (≥0.5)** |
|---|---|---|---|
| **Learning motivation** | – | 0.958 | 0.919 |
| | EM | 0.915 | 0.683 |
| | IM | 0.950 | 0.791 |
| **Extrinsic learning motivation** | – | 0.950 | 0.865 |
| | ER | 0.932 | 0.733 |
| | INR | 0.960 | 0.827 |
| | IDR | 0.965 | 0.845 |

EM = Extrinsic learning motivation; ER = External regulation; ELM = Extrinsic learning motivation; IDR = Identified regulation; IM = Intrinsic motivation; INR = Introjected regulation; LM = learning motivation.

The reliability of the indicators was evaluated by analyzing the outer loadings of each item. According to Hair et al. (2019), an outer loading value of at least 0.5 is required. As shown in Table 5, all items had outer loadings exceeding the threshold, confirming the unidimensionality of the constructs.

**Table 5: Outer loadings values**

| Second order construct | First order construct | Item description | Outer loadings (≥0.50) |
|---|---|---|---|
| Learning motivation | **EM** | -- | 0.952 |
| | **EM1** | Because this is the profession that I chose for my future. | 0.846 |
| | **EM2** | To be able to make better choices for university. | 0.852 |
| | **EM3** | To get a good job in the field of my vocational major. | 0.860 |
| | **EM4** | To show my family that I'm successful in my vocational major. | 0.830 |
| | **EM5** | I want to be praised by the people around me. | 0.737 |
| | **IM** | -- | 0.965 |
| | **IM1** | I find discussions about my vocational major. | 0.896 |
| | **IM2** | Learning new things in my vocational major that I am interested in is enjoyable. | 0.865 |
| | **IM3** | I enjoy sharing the new things that I learn in my vocational major. | 0.857 |
| | **IM4** | I enjoy learning my vocational major subjects. | 0.912 |
| | **IM5** | I enjoy reading magazines and texts related to my vocational major. | 0.881 |
| Extrinsic Learning Motivation | **ER** | -- | 0.904 |
| | **ER1** | Because with only a high school degree, I would not find a high-paying job later on. | 0.727 |
| | **ER2** | In order to obtain a more prestigious job later on. | 0.825 |
| | **ER3** | Because I want to have "the good life" later on. | 0.899 |
| | **ER4** | In order to have a better salary later on. | 0.913 |
| | **ER5** | In order to have a better development later on. | 0.903 |
| | **INR** | -- | 0.949 |
| | **INR1** | To prove to myself that I am capable of completing my college degree. | 0.909 |
| | **INR2** | To show myself that I can succeed in my studies. | 0.935 |
| | **INR3** | Because of the fact that when I succeed in college, I feel important. | 0.912 |
| | **INR4** | To show myself that I am an intelligent person. | 0.887 |
| | **INR5** | To affirm my competence to get the skills and knowledge. | 0.902 |
| | **IDR** | -- | 0.936 |
| | **IDR1** | I think that a college education will help me better prepare for the career I have chosen. | 0.902 |
| | **IDR2** | Eventually, it will enable me to enter the job market in a field that I like. | 0.907 |
| | **IDR3** | This will help me make a better choice regarding my career orientation. | 0.949 |
| | **IDR4** | I think that a college education will help me make better decisions regarding my future. | 0.952 |
| | **IDR5** | I believe that a few additional years of education will improve my competence as a worker. | 0.883 |

EM = Extrinsic learning motivation; IM= Intrinsic motivation; ER = External regulation; INR = Introjected regulation; IDR = Identified regulation

### 3.5 Measurement and Data Analysis

The study utilized SPSS 26.0 for data processing. Descriptive statistics were employed to outline key sample characteristics and to assess the level of extrinsic learning motivational regulation. Specifically, the study measured three forms of regulation: external regulation, introjected regulation, and identified regulation. These were assessed through a validated questionnaire administered to the respondents. To explore the relationship between these forms of regulation and extrinsic learning motivation, SmartPLS 4.0 was utilized. This software allowed us to model the complex interrelationships among constructs, examining how different forms of external regulation contributed to variations in learning motivation. By employing partial least squares structural equation modeling, we could assess the strength and pathways of influence between each form of regulation and overall learning motivation levels.

Pearson correlation analysis was utilized in this research. This technique allowed us to examine the strength and direction of the relationship between each form of external regulation and learning motivation levels. Furthermore, to understand the impact of each form on overall learning motivation, multiple regression analysis was conducted. This approach enabled us to determine the extent to which each type of external regulation predicts changes in learning motivation, accounting for potential confounding variables. By explicitly detailing what was measured and linking these measures to the analytical methods, the clarity and comprehensiveness of the analysis process were enhanced.

## 4. Results

### 4.1 Descriptive Statistics for Learning Motivation and Extrinsic Learning Motivation

Table 6 presents the descriptive statistics for learning motivation. The overall motivation mean was high ($M = 3.89$, $SD = 0.759$). For extrinsic motivation subscales, all means exceeded 3.95: external regulation ($3.99 \pm 0.772$), introjected regulation ($4.01 \pm 0.772$), and identified regulation ($3.98 \pm 0.782$). Introjected regulation showed the highest score. These results suggest that both intrinsic and extrinsic factors play a significant role in driving students' learning motivation, with introjected and identified regulation being particularly prominent.

**Table 6: Descriptive statistics for learning motivation and extrinsic learning motivation**

| Sub-construct | Items label | Mean | Std. Deviation | Mean level |
|---|---|---|---|---|
| **Extrinsic motivation** | | 3.95 | .761 | High |
| | EM1 | 4.00 | .914 | High |
| | EM2 | 4.06 | .890 | High |
| | EM3 | 4.05 | .881 | High |
| | EM4 | 3.76 | .947 | High |
| | EM5 | 3.88 | .987 | High |
| **Intrinsic motivation** | | 3.83 | .822 | High |
| | IM1 | 3.77 | .945 | High |
| | IM2 | 4.02 | .840 | High |
| | IM3 | 3.87 | .925 | High |
| | IM4 | 3.82 | .948 | High |
| | IM5 | 3.68 | .962 | High |
| **Learning motivation** | | 3.89 | .759 | High |
| **External regulation** | | 3.99 | .772 | High |
| | ER1 | 3.72 | 1.075 | High |
| | ER2 | 3.86 | .987 | High |
| | ER3 | 4.17 | .817 | High |
| | ER4 | 4.07 | .852 | High |
| | ER5 | 4.15 | .812 | High |
| **Introjected regulation** | | 4.01 | .772 | High |
| | INR1 | 4.06 | .859 | High |
| | INR2 | 4.05 | .858 | High |
| | INR3 | 4.04 | .854 | High |
| | INR4 | 3.87 | .897 | High |
| | INR5 | 4.07 | .780 | High |
| **Identified regulation** | | 3.98 | .782 | High |
| | IDR1 | 4.06 | .817 | High |
| | IDR2 | 3.94 | .873 | High |
| | IDR3 | 3.97 | .866 | High |
| | IDR4 | 4.00 | .828 | High |
| | IDR5 | 3.98 | .874 | High |
| **Extrinsic Learning motivation** | | 3.99 | .717 | High |

### 4.2 Relationship Between Learning Motivation and Extrinsic Learning Motivation

A Pearson correlation analysis was performed to seek the relationship between learning motivation and the three sub-constructs of extrinsic learning motivation. As shown in Table 7, all three forms of extrinsic learning motivation were significantly and positively correlated with learning motivation. External regulation showed a moderate correlation with learning motivation ($r = 0.658$, $p < 0.01$), while introjected regulation ($r = 0.757$, $p < 0.01$) and identified regulation ($r = 0.784$, $p < 0.01$) displayed stronger correlations. These findings suggest that the more vocational students internalize external motivators, the stronger their overall learning motivation becomes, with identified regulation having the most substantial impact.

**Table 7: Pearson correlation analysis**

| | | Learning motivation |
|---|---|---|
| **ER** | Pearson Correlation | .658** |
| | p-value | .000 |
| **INR** | Pearson Correlation | .757** |
| | p-value | .000 |
| **IDR** | Pearson Correlation | .784** |
| | p-value | .000 |

In addition, Table 8 shows that the overall correlation between extrinsic learning motivation and learning motivation is 0.793, indicating that the influence of extrinsic learning motivation on learning motivation has a strong positive relationship overall.

**Table 8: Correlation analysis**

| | Extrinsic learning motivation | Learning motivation |
|---|---|---|
| **Extrinsic learning motivation** | 1 | .793** |
| **Learning motivation** | .793** | 1 |

Note: **significant at 1% level (0.01)

Correlation analysis shows that the three adjustment methods of extrinsic learning motivation all had significant positive correlation with learning motivation. The identified regulation had the most significant impact on learning motivation. Overall, there was a strong positive correlation between extrinsic learning motivation and learning motivation. This suggests that extrinsic learning motivation plays a significant role in enhancing students' learning motivation.

### 4.3 Effects of Extrinsic Learning Motivation on Learning Motivation

To empirically examine the hierarchical effects of extrinsic motivational constructs within vocational education, a multiple regression analysis was conducted with students' learning motivation as the dependent variable and the three regulation types (external, introjected, identified) as predictors. As shown in Table 9 and Table 10, the model demonstrated strong explanatory power, accounting for 65.1% of the variance in learning motivation ($R^2 = 0.651$, $F(3, 505) = 313.973$, $p < 0.001$), thereby statistically validating the theoretical framework derived from the SDT (Ryan & Deci, 2020b).

**Table 9: Model summary[b]**

| Model | R | $R^2$ | Adjusted $R^2$ | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .807a | .651 | .649 | .44966 |

a. Predictors: (Constant), IDR, ER, INR

b. Dependent variable: Learning motivation

**Table 10: ANOVA[a]**

| | Model | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 190.448 | 3 | 63.483 | 313.973 | .000b |
| | Residual | 102.107 | 505 | .202 | | |
| | Total | 292.555 | 508 | | | |

a. Dependent variable: Learning motivation[b].
b. Predictors: (Constant), IDR, ER, INR

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**Table 11** presents that identified regulation emerged as the most potent predictor ($\beta = 0.481$, $p < 0.001$), underscoring the SDT's postulate that motivation quality escalates with deeper internalization of extrinsic goals (Li et al., 2024). This aligns with vocational students' career-oriented mindset, wherein educational tasks perceived as congruent with aspirational professional identities (e.g., "mastering coding to become a software engineer") catalyze autonomous engagement (Liao et al., 2024). Identity regulation enhances learning motivation through professional value integration, and this effect is significantly amplified in a supportive environment (Han & Huang, 2022).

Introjected regulation also exhibited a significant, albeit weaker, positive effect ($\beta = 0.296$, $p < 0.001$), suggesting that vocational students' motivation can be enhanced through internalized social-emotional pressures (e.g., striving to meet professional standards or avoiding guilt associated with underperformance) (Chen et al., 2024). This finding aligns with studies indicating that introjection, despite its partial internalization nature, plays a transitional role in fostering motivation within goal-oriented vocational contexts (Rothes et al., 2022).

Conversely, external regulation failed to reach significance ($\beta = 0.075$, $p = 0.081$), challenging conventional pedagogical reliance on reward-punishment systems (Danladi & Abdullahi, 2023). This null effect may stem from vocational learners' developmental stage. As emerging professionals, their motivation appears less susceptible to transactional incentives (e.g., grades) than to value-congruent skill internalization—a phenomenon empirically observed in autonomy-supportive environments (Chen et al., 2024; Johansen et al., 2023).

**Table 11: Coefficient[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | P-value | 95.0% Confidence Interval for B | |
|---|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | | Lower Bound | Upper Bound |
| 1 | (Constant) | .565 | .113 | | 4.992 | .000 | .343 | .788 |
| | ER | .074 | .042 | .075 | 1.750 | .081 | –.009 | .157 |
| | INR | .291 | .052 | .296 | 5.552 | .000 | .188 | .394 |
| | IDR | .467 | .048 | .481 | 9.699 | .000 | .372 | .561 |

a. Dependent variable: Learning motivation

## 5. Discussion of the Findings

Descriptive statistics for learning motivation and extrinsic learning motivation show the high levels of motivation present among vocational students. The mean scores indicate that both intrinsic and extrinsic factors are significant contributors to students' motivational levels (Serin, 2018). The elevated scores across external, introjected, and identified regulation suggest a balanced interaction between self-determined motivations and those influenced by external factors (Tokan & Imakulata, 2019). Notably, introjected and identified regulations stand out, suggesting that internalized motivations, driven by personal goals and internal pressures, play a pivotal role in shaping student motivation (Tran & Nguyen, 2021).

The relationship between learning motivation and its extrinsic components, explored through Pearson correlation analysis, further emphasizes this interplay. Interestingly, identified regulation emerges as the form with the strongest correlation, implying that when students align their educational activities with personally meaningful goals, their motivation deepens (Bureau et al., 2022). This contrasts with Pranawengtias (2022)'s emphasis on external motivators in collectivist academic settings, implying vocational contexts may uniquely amplify internalization processes due to their skill-to-career focus. This finding highlights the transformative power of deeply internalized motivations over more superficial external rewards or punishments.

Advancing beyond correlation, the multiple regression analysis provides a comprehensive view of how different extrinsic motivational constructs impact learning motivation. The regression results further clarify this hierarchy: introjected and identified regulation positively predict learning motivation, whereas external regulation lacks significance. This supports the SDT's assertion that externally imposed incentives (e.g., grades) may initiate engagement but fail to sustain it without internal value congruence (Kuratomi et al., 2023). Notably, our results extend Bureau et al. (2022)'s findings from general to vocational education, highlighting a critical nuance of career-aligned internalization (e.g., "becoming a skilled technician"), which may intensify identified regulation's role compared to broader academic goals.

Overall, this study elucidates the crucial role of extrinsic learning motivation, especially identified regulation, in fostering an environment conducive to learning among vocational students (Ryan & Deci, 2020b). This emphasis on identified regulation directly challenges vocational pedagogy's traditional reliance on external rewards (Danladi & Abdullahi, 2023). Instead, fostering goal-personalization strategies (e.g., connecting curriculum to students' aspirational identities) could enhance motivation longevity, as internalized drivers outperform superficial incentives. Future studies should explore cultural or institutional moderators (e.g., societal expectations) to explain divergences from prior findings (Liao et al., 2024).

## 6. Validation of the Study Hypotheses

Based on the data analysis results, the verification of the three research hypotheses is:

H1: External regulation has a significant positive impact on vocational students' learning motivation.

Although it was hypothesized that external regulation would have a significant positive impact on learning motivation, the results show that the relationship was weak and not significant ($\beta = 0.075$, $p = 0.081$). This divergence from hypotheses may reflect vocational students' desensitization to external contingencies (e.g., grades, punishments) due to their distinct learning context. Unlike learners who often respond to immediate rewards (Hellín et al., 2023), vocational students' career-oriented training likely prioritizes internalized goal congruence over short-term incentives—a pattern consistent with the SDT's hierarchy of motivation internalization (Ryan & Deci, 2020b). This aligns with Johansen et al. (2023)'s observation that external regulation effects diminish in autonomy-supportive environments, suggesting contextual moderators may override generic reward mechanisms. Consequently, H1 is not supported.

H2: Introjected regulation has a significant positive impact on vocational students' learning motivation.

The data show that introjected regulation has a significant positive impact on learning motivation ($\beta = 0.296$, $p < 0.001$). This suggests that motivation is significantly enhanced when students internalize external pressure as a self-judgmental mechanism. This mirrors the SDT's characterization of introjection as partial internalization (Ryan & Deci, 2020b). It may be that vocational students have a stronger need for social approval and guilt avoidance (e.g., "I should master nursing skills to avoid failing patients"). This is consistent with the description of "introjected motivation" in the SDT, which emphasizes the importance of emotional factors in students' learning motivation. To better utilize this motivational mechanism in education, consider introducing self-reflective activities into the curriculum. Therefore, H2 is supported.

H3: Identified regulation has a significant positive impact on vocational students' learning motivation.

The identified regulation had the most significant effect on learning motivation ($\beta = 0.481$, $p < 0.001$), replicating Chiu et al. (2023)'s findings in university Science, Technology, Engineering, and Mathematics programs but extending their applicability to vocational domains. This means that students are at their highest levels of motivation when they deeply integrate their learning goals with their personal values and future career goals. This mechanism is significantly amplified in a supportive environment. Han & Huang (2022) showed that teacher autonomy support and a positive class atmosphere reinforced the perception of value internalization (such as "the course content is directly related to career development"), which increased the promotion effect of identity regulation to $B = 1.895$ ($p < 0.001$). The results are highly consistent with the intrinsic motivation theory, indicating that strengthening students' value identity through curriculum design can significantly improve learning outcomes. Educators can use this to support the integration of learning goals with students' personal growth through

goal setting and promotion activities to make learning more relevant and meaningful. Therefore, H3 is supported.

The results of this study provide clear evidence that both introjected and identified regulation play significant roles in shaping vocational students' learning motivation. Identified regulation, in particular, has the strongest positive effect, suggesting that students who align their educational goals with personal values and future aspirations exhibit the highest levels of motivation. This finding is consistent with previous research emphasizing the significance of identified motivation in academic settings. For instance, Maulana et al. (2016) demonstrated the pivotal role that identified motivation plays in enhancing students' engagement and performance in educational contexts.

In contrast, external regulation shows a limited influence on learning motivation, indicating that external rewards alone may not be sufficient to sustain long-term motivation in vocational students. This aligns with the SDT, which posits that more internalized forms of extrinsic motivation, such as identified regulation, are more effective in fostering learning motivation (Scott Rigby et al., 1992). The strong positive effect of identified regulation reinforces the idea that when vocational students perceive alignment between their educational goals and personal values, their motivation to engage in learning activities is significantly enhanced. Conversely, the findings regarding external regulation are consistent with studies (Hidi, 2016), suggesting that external rewards and punishments alone are inadequate for maintaining long-term motivation.

This study contributes to the literature on vocational education by highlighting the critical role of internalized extrinsic learning motivation in shaping learning outcomes. The findings extend the application of the SDT by demonstrating how identified and introjected regulation function specifically in vocational contexts. From an educational practice perspective, the results suggest that vocational educators should focus on fostering students' internalized motivation by helping them recognize the personal relevance and long-term value of their studies. Encouraging students to align their academic goals with their future career aspirations can significantly enhance their learning motivation. Policymakers in vocational education should consider designing curricula that emphasize the connection between academic content and real-world professional skills. Such an approach can support the development of identified regulation, as students recognize a clear link between their education and future career success.

Future research could explore how demographic factors, such as family background or parental education levels, interact with students' motivation. Additionally, longitudinal studies would provide deeper insights into how motivation evolves throughout the vocational education journey. Further exploration of the role of external regulation in different educational settings could also yield valuable insights.

## 7. Conclusion

This study investigated the relationship between vocational students' extrinsic learning motivation regulation methods and their overall learning motivation. The findings revealed the key role of internalized motivation, particularly identified regulation, in enhancing learning motivation. Students who align their learning goals with personal values and future career aspirations exhibit significantly higher motivation levels. Conversely, the influence of external regulation was weak and not significant, suggesting that reliance solely on external incentives or deterrents is insufficient to sustain long-term learning motivation in vocational students. These results support the SDT, emphasizing the importance of internalization in motivation. Educational strategies should focus on fostering students' capacity to internalize meaningful educational goals. By encouraging vocational students to integrate learning with their personal aspirations and values, educators can cultivate a more enduring and effective motivational climate. Future research should expand upon these findings by exploring the potential associations between demographic characteristics and learning motivation. Investigating how variables such as age, gender, socioeconomic status, and cultural background influence motivational mechanisms could lead to a deeper understanding of the diverse motivational profiles present in vocational settings. Additionally, further studies might examine the long-term impacts of internalized motivation on academic performance and career success, thus contributing valuable insights to the fields of motivation theory and educational psychology.

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**Appendix A: Demographics**

| | | | | |
|---|---|---|---|---|
| 1. School name: | | | | |
| 2. Grade: | Grade 1 | ▢ | Grade 2 | ▢ |
| 3. Major: | Nursing major | ▢ | Computer major | ▢ |
| 4. Class leadership role: | Class committee member | ▢ | Non-class committee member | ▢ |
| 5. Sex: | Male | ▢ | Female | ▢ |
| 6. Family location: | Rural area | ▢ | Town | ▢ |
| | County | ▢ | City | ▢ |
| 7. Father's education completed level: | Junior high school | ▢ | High school | ▢ |
| | Junior college | ▢ | Undergraduate and above | ▢ |
| 8. Mother's education completed level: | Junior high school | ▢ | High school | ▢ |
| | Junior college | ▢ | Undergraduate and above | ▢ |
| 9. Household income: | 0–20,000RMB/year | ▢ | 20,000–30,000RMB/year | ▢ |
| | 30,000–40,000RMB/year | ▢ | above 40,000RMB/year | ▢ |
| 10. Number of brothers and sisters in the family: | ( ) | | | |

**Appendix B: Learning motivation (LM)**

| LM Questionnaire | Strongly Disagree | Disagree | Not Sure | Agree | Strong Agree |
|---|---|---|---|---|---|
| 11. Because this is the profession that I chose for my future. | ▢ | ▢ | ▢ | ▢ | ▢ |
| 12. To be able to make better choices for university. | ▢ | ▢ | ▢ | ▢ | ▢ |
| 13. To get a good job in the field of my vocational major. | ▢ | ▢ | ▢ | ▢ | ▢ |
| 14. To show my family that I'm successful in my vocational major. | ▢ | ▢ | ▢ | ▢ | ▢ |
| 15. I want to be praised by the people around me. | ▢ | ▢ | ▢ | ▢ | ▢ |
| 16. I find discussions about my vocational major. | ▢ | ▢ | ▢ | ▢ | ▢ |
| 17. Learning new things in my vocational major that I am interested in is enjoyable. | ▢ | ▢ | ▢ | ▢ | ▢ |
| 18. I enjoy sharing the new things that I learn in my vocational major. | ▢ | ▢ | ▢ | ▢ | ▢ |
| 19. I enjoy learning my vocational major subjects. | ▢ | ▢ | ▢ | ▢ | ▢ |
| 20. I enjoy reading magazines and texts related to my vocational major. | ▢ | ▢ | ▢ | ▢ | ▢ |

**Appendix C: Extrinsic learning motivation (ELM)**

| ELM Questionnaire | Strongly Disagree | Disagree | Not Sure | Agree | Strong Agree |
|---|---|---|---|---|---|
| 21. Because with only a high school degree, I would not find a high-paying job later on. | ▢ | ▢ | ▢ | ▢ | ▢ |
| 22. In order to obtain a more prestigious job later on. | ▢ | ▢ | ▢ | ▢ | ▢ |
| 23. Because I want to have "the good life" later on. | ▢ | ▢ | ▢ | ▢ | ▢ |
| 24. In order to have a better salary later on. | ▢ | ▢ | ▢ | ▢ | ▢ |
| 25. In order to have a better development later on. | ▢ | ▢ | ▢ | ▢ | ▢ |
| 26. To prove to myself that I am capable of completing my college degree. | ▢ | ▢ | ▢ | ▢ | ▢ |
| 27. To show myself that I can succeed in my studies. | ▢ | ▢ | ▢ | ▢ | ▢ |
| 28. Because of the fact that when I succeed in college, I feel important. | ▢ | ▢ | ▢ | ▢ | ▢ |
| 29. To show myself that I am an intelligent person. | ▢ | ▢ | ▢ | ▢ | ▢ |
| 30. To affirm my competence to get the skills and knowledge. | ▢ | ▢ | ▢ | ▢ | ▢ |
| 31. I think that a college education will help me better prepare for the career I have chosen. | ▢ | ▢ | ▢ | ▢ | ▢ |
| 32. Eventually, it will enable me to enter the job market in a field that I like. | ▢ | ▢ | ▢ | ▢ | ▢ |
| 33. This will help me make a better choice regarding my career orientation. | | | | | |
| 34. I think that a college education will help me make better decisions regarding my future. | | | | | |
| 35. I believe that a few additional years of education will improve my competence as a worker. | | | | | |