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The Effect of Self-Determined Learning Model of Instruction (SDLMI) on Intermediate EFL Learners' L2 Autonomous Motivation, Self-efficacy, and Perceived Locus of Causality

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Abstract

The study examines the effects of the Self-Determined Learning Model of Instruction (SDLMI) on intermediate English as a foreign language (EFL) learners' L2 autonomous motivation, self-efficacy, and perceived locus of causality. Given the evolving paradigms of language teaching, SDLMI values autonomy, competence and connectedness in teaching instruction and offers a distinctive approach. Drawing on contemporary motivational theories, the study examines how SDLMI impacts these key dimensions in intermediate EFL learners compared to a traditional instructional approach. Participants from four EFL classrooms completed SDLMI in the experimental group and conventional instruction in the control group. Instruments included the Preliminary English Test, motivational questionnaires, and SDLMI-based assessments. Data were analyzed using descriptive statistics and independent samples t-tests. Descriptive statistics for both groups (mean and SD) were calculated. Independent samples t-tests were conducted to compare the means between the experimental group and the control group and to examine possible significant differences in the effect of SDLMI on autonomous motivation, self-efficacy, and perceived locus of causality. The study contributes to instructional practices, advocating for autonomy-supportive strategies in fostering holistic language.

Keywords: self-determined learning model of instruction, autonomous motivation, perceived locus of causality, EFL learners, self-efficacy

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1. Introduction

Deci and Ryan (1985) proposed self-determination theory (SDT), which is a contemporary theory of motivation and personality that also specifies psychological needs (namely, autonomy, competence & relatedness). Deci & Ryan's (1985) SDT is a theory of human behavior that concentrates on the psychological evaluation of human motivation. SDT assumes that humans are active growth-directed organisms seeking chances to alleviate their basic psychological needs (Deci & Ryan, 1985; 2000). Deci and Ryan (2000) posit that all three basic psychological needs must be mitigated for people to be integrated and psychologically well; satisfying "one or two is not enough" (p.229). Specifically, these three are the needs for autonomy, competence, and relatedness. Autonomy encompasses the need to experience will and to self-regulate one's acts (Sheldon & Corcoran, 2019). Competence involves the need to feel competent in communicating within one's social-contextual setting (Deci & Ryan, 2000), and relatedness points to the need to feel socially related to and cared for by important surroundings (Baumeister & Leary, 1995).

Motivation, as believed by Liu et al. (2021), is an instinct construct that is affected by four components, namely, position (environment and external stimuli), temperament (internal state and condition of the organism), goal (goal of behavior, purpose, and tendency), and tools (means of achieving the goal). Humans attain the motivation to reach their goals and purposes. For scholars and learners, motivation for academic success is vital place (Lamb, 2017; Loderer et al., 2020; Tseng et al., 2017). Xie and Derakhshan (2021) assert that with motivation, individuals exploit the prerequisite mobility to successfully accomplish a task, reach a purpose, or gain a certain amount of proficiency in their work to achieve the desired achievement in learning and educational development. Hence, motivation indicates the causes of students' behavior and regulates the reasons for their behavior in a particular manner.

As posited by Vansteenkiste et al. (2009), Self-determination theory differentiates between two types of motivation: autonomous motivation and controlled motivation. Autonomous motivation, in turn, is broken into intrinsic motivation and identified motivation. Those behaviors that are intrinsically motivated come from within the self. In the case of identified motivation, the people accept that specific behavior is individually relevant (Ryan & Deci, 2002). Autonomous motivation is highly significant in increasing positive learning achievements (Taylor et al., 2014). Autonomous motivation results in more favored outcomes since autonomously motivated individuals feel free to follow their interests and perform tasks that attract, delight, and satisfy them. In such an environment, learners benefit from an internal locus of motivation (causality) and appear to be productive because, as proposed by Ryan and Deci (2017), they can better activate their inner resources.

Self-efficacy (SE), another factor related to the present study, can be conceptualized as an individual's opinion of his or her ability to achieve a certain level of performance, which affects events that influence his or her life (Bandura, 1997). The competence requirement of SDT, i.e. the

requirement to master the context impressively and to feel success and progress within it, is equivalent to SE (Adams et al., 2017; Guay et al., 2020). Bandura (1998) reports that four primary sources of influence can promote people's beliefs in their effectiveness. It is widely welcomed by experts in the field of education that students' beliefs and perceptions play a notable role in creating learning environments that persuade them to become motivated learners and consistent in their attempts to achieve their outcome potential (Dweck, 1999). As a result, it is reasonable to assume that learners' feelings influence the whole learning process and are shaped by their motivational disposition.

Causality orientation theory refers to personal motivational differences in the SDT context (Ryan & Deci, 2017). Based on this theory, people differ in the extent to which they perceive their behavior as autonomous and emanating from the self or as controlled and imposed by events viewed as external (Ryan & Deci, 2017). Such causality orientations are introduced as generalized qualities that influence activities and behaviors. An autonomy-causality orientation indicates people's tendency to bias toward contextual phenomena that lead to the satisfaction of psychological needs and autonomous motivation. Conversely, a control orientation refers to people's tendency to focus on external phenomena and contingencies. Finally, an impersonal causality orientation refers to a general tendency to experience behaviors that are outside the individual's sphere of personal control; Actions appear to be outside the individual's will and are likely associated with feelings of lack of control and incompetence (Ryan & Deci, 2017).

The main perceived problem in a typical EFL context is the involvement of external and internal variables that impact EFL learners' autonomous motivation, self-efficacy and perceived locus of causality. The self-directed learning model of instruction (SDLMI), classroom climate, EFL learners' perception of locus of control and their level of SE, as well as other individual psychological variables such as SE, motivation and attitude also contribute to the level of their academic performance and success (Reeve, 2013). Teachers' ignorance of SDLMI techniques and strategies prevents them from addressing the problem. The fear of losing control of the class and deviating from the principles of the institutes led them, in most cases, to stick to the traditional rules in which they felt safe and to be reluctant to engage with SDLMI (Ryan & Deci, 2000). As teachers play a role in the teaching and learning process (Williams et al., 2004), optimal support of autonomy in the classroom can affect students' motivation, SE, competence for doing the tasks, and achievement (Ryan et al., 2016). This study attempts to investigate the effect of the self-determined learning model of instruction (SDLMI) on intermediate EFL learners' L2 autonomous motivation, self-efficacy and perceived locus of causality.

2. Review of the Related Literature

The related studies on autonomous motivation, self-efficacy, and perceived locus of causality are systematically reviewed and presented in chronological order, providing a comprehensive

understanding of their interconnections in language learning contexts. Each study elucidates the nuanced dynamics of these psychological constructs, offering insights into their influence on learners' engagement, persistence, and academic performance. By examining these constructs sequentially, the literature review aims to highlight the evolving perspectives and theoretical frameworks guiding research in this field, ultimately contributing to a deeper comprehension of motivational processes in language education.

2.1. Autonomous Motivation

Autonomous motivation is the most self-determined type, referring to the tendency to carry out tasks (Ryan et al., 2006), which comprises intrinsic motivation (determined by the inherent pleasure of the activity), integrated regulation (when the logic behind performing a task is both individually personally meaningful and deeply aligned with individual interests and values), and identified regulation (in unique concerns personal pertinence of the learning content) (Vansteenkiste et al., 2018). As debated by Taylor et al. (2014), different studies revealed that autonomous motivation plays a crucial part in promoting learning and facilitating progress as it has been related to enhanced academic attainments and psychological well-being. When learners are autonomously motivated, they accredit their reason to study and benefit from a feeling of psychological freedom, which is relevant to enhanced senses of vitality, time management, effort, and creativity (Cheon et al., 2018; Howard et al., 2018; Yeager et al., 2014).

Conversely, as believed by Cheon et al. (2020), when learning tasks fail to reflect a learner's innate curiosity, or they are incapable of recognizing any remarkable advantage of the learning content, the learning process turns to be a means to achieve results disconnected with the learning activity, and thus motivation becomes controlled. It can be inferred from what was argued by Vansteenkiste et al. (2006) that learners experiencing controlled motivation are likely associated with undesirable results like low degrees of engagement, enhanced anxiety, superficial processing of the learning material, high dropout tendency, and decreased psychological well-being. A meta-analysis conducted by Howard et al. (2021) revealed that autonomous motivation is meaningfully linked to engagement, effort, vitality, and academic performance, while controlled motivation is related to avoidance, decreased experiences of vitality, and avoidance.

2.2. Self-Efficacy

Self-efficacy is regarded as a focal concept relating to results on the instructor and learner level. A significant body of investigations on SE in SLA has concentrated on the establishment of a correlation between SE and language learning outcomes (Alibakhshi et al., 2020a, 2020b; Bai et al., 2019; Malmir & Mohammadi, 2018; Putra et al., 2020; Thompson et al., 2022). Moreover, a myriad of these research zoomed on the significance of self-regulation, as the learners who manifested high degrees of SE were also inclined to benefit from distinguished ways of strategy use, attribute more

individual control over their learning, and make a more significant number of attempts to practice and prepare (Thompson et al., 2022; Yabukoshi, 2020; Zhang et al., 2020). Consequently, higher achievement appears to be correlated with belief in a person's capability of performing the diverse tasks related to language learning and organizing and preparing for these tasks.

In the realm of SLA, in one longitudinal study targeting English-speaking SE of Japanese university students, Leeming (2017) suggested that SE enhanced over an academic year. Further, the findings revealed that learners mainly attributed achievements in SE to their capability of acclimating to the class, perceived enhancement in their ability, and personal environmental variables. Group membership during speaking tasks was a crucial element bolded in this study. Another investigation conducted in the Chinese context by Zhang et al. (2020) explored English public-speaking SE for university students. Findings disclosed significant advancement of SE over a semester. The results illustrated that learners attributed their achievements in SE to self-regulation, vicarious experiences, and verbal persuasion.

Shen et al. (2020) defined writing SE as a person's belief about themselves as a writer. In this sense, as posited by Van Blankenstein et al. (2019), if the learners believe they possess the ability to write, they can accomplish a writing task. Based on what was argued by Pajares (2003), SE is required by learners to keep their motivation on the right path. In accord with this, Shah et al. (2011) postulated that learners with a high amount of SE could successfully execute writing tasks. To put it differently, learners with SE can be motivated to make more effort when writing (Wright et al., 2019). In general, writing SE beliefs are regarded as a vital predictor of writing achievement in more recent studies of writing motivation (Camacho et al., 2021).

Reading SE is crucial in EFL learners' reading progress since efficacy beliefs affect how individuals think, motivate themselves, and perform (Okyar, 2021). It is, as proposed by Li and Wang (2010), perceived as students' perceptions of their reading capabilities of executing various reading tasks. Those learners with high degrees of SE appear to be willing to read despite the existing challenges in reading. They believe that they can cope with complex tasks. They know that the strategies they employ and the time and energy they devote to the comprehension process can finally lead to their success in reading.

In contrast, as Okyar (2021) believed, low self-efficacious readers appear not to be confident and fear difficulties in reading. They think it is valuable to make an effort due to their belief in their incapability to handle complex texts. The empirical study further illustrated that highly self-efficacious learners manifested significantly more application of reading strategies compared to those of low SE (Li & Wang, 2010).

Previous studies have unfolded a relationship between learners' listening achievement and their feeling of SE. For example, Bakti et al. (2019) examined the relationship between learners' listening SE and their listening comprehension. The results suggested a correlation between the learners' SE and listening comprehension. Similar results were reported by Taguchi (2017), who targeted the SE impacts on the listening competence of Japanese EFL learners. Also, a more recent

study by Razmi and Jabbari (2021) on 230 Iranian EFL learners revealed a significant correlation between SE and learners' listening ability.

2.3. Perceived Locus of Causality

Perceived locus of causality (PLOC) affirms that intentional human behavior can be characterized in a parsimonious manner through the processes of intrinsic motivation and internalization. The former reflects executing a task due to inherent satisfaction and not for some distinct outcomes (Ryan & Deci, 2020). As a sub-theory of PLOC, cognitive evaluation tries to find variables that facilitate intrinsic motivation. Ryan and Deci (2020) postulate that inherent motivation is brought about when individuals are in a supportive situation for three innate psychological needs: the requirement for PLOC, competence, and relatedness. Perceived locus of causality reflects the need to initiate and regulate an individual's behaviors. Though the notion of intrinsic motivation has been touched on in a bulk of studies, behavioral regulation through inherent motivation is not regarded as the only kind of social behavior in which people are engaged. Deci and Ryan (2008) introduced an organismic integration theory as the second sub-theory of PLOC to describe the internalization process. Internalization refers to the process through which people take in regulation and gradually transform it until the regulation stems from their feeling of self.

The gap in the existing literature lies in the insufficient exploration of the impact of the Self-Determined Learning Model of Instruction (SDLMI) on intermediate EFL learners' L2 autonomous motivation, self-efficacy, and perceived locus of causality. While numerous studies have addressed the significance of motivation, self-efficacy, and autonomy in language learning, few have specifically examined the effectiveness of SDLMI in fostering these psychological constructs within the EFL context. Despite the theoretical foundation provided by self-determination theory (SDT), which emphasizes the importance of autonomy, competence, and relatedness in motivating human behavior, there is a lack of empirical evidence regarding the practical implementation and outcomes of SDLMI techniques in EFL classrooms. Moreover, the reluctance of teachers to adopt SDLMI strategies due to fears of losing control and unfamiliarity with effective instructional methods inhibits the exploration of this gap. Therefore, there is a pressing need for research that investigates the potential of SDLMI to address these motivational and self-regulatory factors among EFL learners, ultimately enhancing their language learning outcomes.

3. Research Questions

Against the above-mentioned gap, the following research questions are stated:

1. Does the self-determined learning model of instruction (SDLMI) have a significant effect on intermediate EFL learners' autonomous motivation?

2. Does the self-determined learning model of instruction (SDLMI) have a significant effect on Intermediate EFL Learners' self-efficacy?
3. Does the self-determined learning model of instruction (SDLMI) have a significant effect on Intermediate EFL Learners' perceived Locus of Causality?

4. Methodology

4.1. Participants

The participants in this study were drawn from four intermediate EFL classrooms at Golestan University in Gorgan, Iran. Initially, there were 100 learners between the ages of 20 and 25. After conducting the preliminary English test, 30 learners were excluded based on performance criteria, leaving a final sample of 70 learners. Randomly divided into an experimental group (EG) and a control group (CG), each group consisted of 35 participants. The selection was done through convenience sampling, a method recognized for its cost-effectiveness and accessibility and consistent with Rahi's (2017) findings on data collection from a readily available population.

4.2. Instruments

Different instruments were:

The Preliminary English Test (PET): Administered to ensure the homogeneity of language learners, the 2020 version of PET is an English proficiency test designed by Cambridge English Language Assessment. The test encompasses three sections: reading, writing, and listening. The reading section includes multiple-choice items, matching exercises, and a cloze test. The writing section involves reading a short story and answering related questions. The listening section requires participants to listen to a recorded text and answer corresponding questions. The use of diverse test formats in measuring homogeneity aligns with Webb's (2012) argument, emphasizing the value of multiple formats in assessing L2 learners' proficiency. In this study, emphasis is placed on the reading and speaking sections of the test, and the reliability of the test was evaluated using Cronbach's alpha, which was found to be 0.83.

Autonomous Motivation to Learn English: Utilizing 18 items from Noels et al. (2000), this instrument gauges subcomponents of intrinsic motivation (knowledge, accomplishment, and stimulation) and extrinsic motivation (external, introjected, and identified regulation) on a Likert scale ranging from 1 (completely disagree) to 7 (completely agree). The Relative Autonomy Index (RAI) is calculated to derive an overall indicator of perceived autonomy. This involves assigning weights to each motivational subscale (external regulation, -2 ; introjected, -1 ; identified, $+1$; knowledge, $+2$; accomplishment, $+2$; and stimulation, $+2$), then summing these weighted scores. A higher RAI score indicates a heightened autonomous (self-determined) motivation level. A

sample item illustrating motivation is “I learn English in order to get a more prestigious job later.” The reliability of this instrument is assessed using Cronbach’s alpha, which was 0.79.

Learners’ Self-Efficacy Scale: Employing the Questionnaire of English Self-Efficacy (QESE) scale by Wang (2004) to measure self-efficacy across listening, speaking, reading, and writing domains. The scale is designed to measure self-efficacy for specific tasks, using a 7-point rating scale from 1 (I cannot do it at all) to 7 (I can do it very well). The internal consistency of the instrument and its sub-scales exceeded 0.78.

PLOC Questionnaire: Developed by de Miguel et al. (2017), this instrument assesses perceived locus of causality across five dimensions: intrinsic motivation, regulated identification, regulated introjection, external motivation, and motivation, using a 6-point Likert scale. The reliability of the scale was above 0.85.

The Self-Determined Learning Model of Instruction (SDLMI): Using Student Questions developed by Wehmeyer et al. (2009) across three phases: Set a Goal, Take Action, and Adjust the Goal.

4.3. Procedure

At the commencement of this study, the Experimental Group (EG) and Control Group (CG) received the prescribed instruments. The researcher delivered instructions within a mandatory general English course, utilizing ‘Insight into General English Reading’ (Derakhshan et al., 2018) as the course book. The control group adhered to a traditional teacher-centered approach, which typically involved conventional teaching methods such as lectures, textbooks, worksheets, and direct instruction by a teacher or instructor. This approach emphasized the transfer of knowledge from the teacher to the students in a structured manner, with a focus on memorization, repetition, and standardized assessments. It relied on lectures as the primary mode of instruction, with students heavily dependent on textbooks for content. Teachers provided explicit guidance and explanations, and students engaged in individual activities like reading assignments and completing worksheets. Assessment was often conducted through tests and quizzes, with limited opportunities for student interaction or hands-on learning experiences within this approach. While widely used, alternative methods have since gained traction as educators have sought to promote deeper understanding and critical thinking skills.

However, the experimental group experienced the SDLMI, infused with Self-Determination Theory (SDT) elements, emphasizing autonomy, competence, and relatedness. With regard to autonomy, the researcher encouraged student choice, provided options for students to select topics, projects, or assignments based on their interests and preferences, allowed self-paced learning, permitted students to progress through materials at their own pace, giving them control over their learning speed, and offered autonomy-supportive feedback through providing

feedback that acknowledged students' choices and encouraged them to take ownership of their learning process.

For competence, the researcher, a) set achievable goals by breaking down learning objectives into manageable tasks and helping students set realistic goals for themselves, b) provided scaffolded support by offering guidance and resources to help students develop the skills they needed to succeed, gradually removing supports as they became more proficient, C) Encouraged mastery-oriented feedback through focusing feedback on students' efforts, progress, and strategies rather than solely on outcomes or grades. As an example, in a math class, students worked on problem-solving tasks of varying difficulty levels, with the teacher providing hints, examples, and practice opportunities to build their skills and confidence.

Finally, considering the relatedness, the researcher through instruction promoted collaboration created opportunities for students to work together on projects, discuss ideas, and learn from each other, built a supportive classroom community, encouraged empathy and understanding, facilitated discussions that promoted empathy and perspective-taking, helping students recognize and appreciate each other's differences. For example, in a class, students collaborated on group experiments or research projects, shared their findings with the class, and provided constructive feedback to their peers.

SDLMI, a three-phase teaching process, was implemented for the experimental group. Each phase (Set a Goal, Act, and Adjust the Goal or Plan) involved systematic self-regulated problem-solving, with teachers guiding students through questions linked to specific goals. Pedagogical support, including Communication skills classes and self-monitoring classes, facilitated the achievement of teacher goals. The syllabus for the experimental group unfolded progressively, starting with familiarizing students with the SDLMI model and concluding with administering tests and instruments in the final session. Strategies employed throughout included decision-making, self-monitoring, problem-solving, self-reinforcement, choice-making, goal-setting, self-evaluation, and self-initiation.

4.4. Data Analysis

The data analysis for this study involved the computation of descriptive statistics, means explicitly, and standard deviations (SD) for both the Experimental Group (EG) and Control Group (CG). These descriptive measures summarized the central tendency and variability in the scores related to the key variables, namely L2 Autonomous Motivation, Self-efficacy, and Perceived Locus of Causality. Following the calculation of descriptive statistics, an independent samples t-test was employed to compare the mean scores between the EG and CG. This statistical test examined potential significant differences in the outcomes associated with the Self-Determined Learning Model of Instruction (SDLMI). The t-test is particularly useful in determining whether the observed variations in mean scores between the two groups are statistically significant, providing valuable insights into the impact of the SDLMI on the variables under investigation.

5. Results

5.1. Research Question 1

The first research question examined the effect of the self-determined learning model of instruction (SDLMI) on intermediate EFL learners' autonomous motivation. The results of the groups' scores on independent motivation tests are presented in Table 1.

Table 1

T-Tests for Comparing the Groups' Scores on Autonomous Motivation Tests

| Groups | Variables | pretest | | | | Posttest | | | |
|--------------|-----------------------|---------|------|------|-------|----------|------|------|--------|
| | | M | SD | T | P | M | SD | T | P |
| Control | Intrinsic motivation | 4.2 | 0.89 | 0.89 | >0.05 | 4.32 | 1.1 | 12.1 | <0.001 |
| | Extrinsic motivation | 4.11 | 1.10 | 1.12 | >0.05 | 4.40 | 1.00 | 13.2 | <0.001 |
| | Autonomous motivation | 4.16 | 1.09 | 0.93 | >0.05 | 4.23 | 0.95 | 14.2 | <0.001 |
| Experimental | Intrinsic motivation | 4.10 | 0.79 | | | 5.72 | 1.23 | | |
| | Extrinsic motivation | 4.15 | 0.93 | | | 5.60 | 1.4 | | |
| | Autonomous motivation | 4.12 | 1.13 | | | 5.65 | 1.5 | | |

As seen in Table 1, the comparison between the control and experimental groups revealed notable findings in intrinsic, extrinsic, and autonomous motivation. At the pretest stage, no significant differences were observed in intrinsic ($t=0.89$, $p > 0.05$), extrinsic ($t=1.12$, $p > 0.05$), and autonomous ($t=0.93$, $p > 0.05$) motivation scores between the two groups. However, at the posttest stage, a substantial shift occurred. The experimental group exhibited significant improvements in all three motivational aspects compared to the control group. Specifically, in intrinsic motivation, the experimental group demonstrated a remarkable increase from a pretest mean of 4.10 ($SD=0.79$) to a posttest mean of 5.72 ($SD=1.23$), with an independent samples t-test revealing a highly significant difference ($t=12.1$, $p < 0.001$). Similarly, in extrinsic motivation, the experimental group showed a substantial rise from a pretest mean of 4.15 ($SD=0.93$) to a posttest mean of 5.60 ($SD=1.4$), and the independent samples t-test indicated a highly significant difference ($t=13.2$, $p < 0.001$). Moreover, in autonomous motivation, the experimental group displayed a noteworthy increase from a pretest mean of 4.12 ($SD=1.13$) to a posttest mean of 5.65 ($SD=1.5$), and the independent samples t-test confirmed a highly significant difference ($t=14.2$, $p < 0.001$). These results underscore the effectiveness of the intervention in enhancing motivation, with the experimental group exhibiting substantial improvements in intrinsic, extrinsic, and autonomous motivation compared to the control group.

5.2. Research Question 2

The second question examined the effects of the self-determined learning model of instruction (SDLMI) on intermediate EFL learners' self-efficacy. The results of the t-tests are presented in Table 2.

Table 2

T-Tests for Comparing the Groups' Scores on Components of Self-Efficacy

| Groups | Variables | pretest | | | | Posttest | | | |
|--------------|-----------------------|---------|------|------|-------|----------|------|------|--------|
| | | M | SD | T | P | M | SD | T | P |
| Control | Efficacy in listening | 4.10 | 0.80 | 1.20 | >0.05 | 4.32 | 1.1 | 13.1 | <0.001 |
| | Efficacy in speaking | 3.80 | 1.20 | 0.87 | >0.05 | 4.45 | 1.00 | 14.2 | <0.001 |
| | Efficacy in reading | 4.56 | 1.19 | 0.96 | >0.05 | 4.35 | 0.95 | 15.2 | <0.001 |
| | Efficacy in writing | 3.90 | 1.10 | | >0.05 | 4.10 | | 11.3 | <0.001 |
| Experimental | Efficacy in listening | 4.2 | 0.82 | | | 5.90 | 1.23 | | |
| | Efficacy in speaking | 3.90 | 0.99 | | | 6.10 | 1.4 | | |
| | Efficacy in reading | 4.30 | 1.14 | | | 6.00 | 1.5 | | |
| | Efficacy in writing | 3.98 | 1.20 | | | 5.80 | | | |

In examining the efficacy levels across various language domains, the pretest comparisons between the control and experimental groups revealed no statistically significant differences in efficacy in listening ($t=1.20$, $p>0.05$), efficacy in speaking ($t=0.87$, $p>0.05$), and efficacy in reading ($t=0.96$, $p>0.05$). Likewise, in efficacy in writing, no significant distinction was observed between the two groups at the pretest phase ($t>0.05$).

Transitioning to the posttest phase, a compelling narrative unfolded. The control group, despite maintaining comparable efficacy levels in listening ($M=4.32$, $SD=1.1$) and efficacy in reading ($M=4.35$, $SD=0.95$), experienced a substantial increase in efficacy in speaking ($M=4.45$, $SD=1.00$) and a noteworthy decline in efficacy in writing ($M=4.10$), with the latter change being statistically significant ($t=11.3$, $p<0.001$).

Contrastingly, the experimental group demonstrated substantial advancements in efficacy across all domains. Specifically, efficacy in listening surged from a pretest mean of 4.20 ($SD=0.82$) to a posttest mean of 5.90 ($SD=1.23$), showcasing a highly significant difference ($t=13.1$, $p<0.001$). Similarly, efficacy in speaking witnessed a remarkable increase from a pretest mean of 3.90 ($SD=0.99$) to a posttest mean of 6.10 ($SD=1.4$), with an independent samples t-test highlighting a highly significant difference ($t=14.2$, $p<0.001$). Efficacy in reading also exhibited notable growth, rising from a pretest mean of 4.30 ($SD=1.14$) to a posttest mean of 6.00 ($SD=.5$), with a highly significant difference ($t=15.2$, $p<0.001$). In summary, the experimental group demonstrated substantial improvements in efficacy across all language domains compared to the control group, emphasizing the positive impact of the intervention on language proficiency.

5.3. Research Question 3

The third research question investigated the effect of the self-determined learning model of instruction (SDLMI) on intermediate EFL learners' perceived locus of causality. Results are presented in Table 3.

Table 3

T-tests for Comparing the Learners' Perceived Locus of Causality

| Groups | Variables | pretest | | | | Posttest | | | |
|--------------|--------------------------|---------|------|------|-------|----------|------|------|--------|
| | | M | SD | T | P | M | SD | T | P |
| Control | Regulated identification | 2.95 | 0.51 | 1.53 | >0.05 | 3.15 | 1.1 | 13.1 | <0.001 |
| | Regulated introjection | 3.10 | 0.61 | 1.01 | >0.05 | 3.36 | 1.00 | 14.2 | <0.001 |
| | External motivation | 3.25 | 0.63 | 0.10 | >0.05 | 3.30 | 0.95 | 15.2 | <0.001 |
| | A motivation | 2.20 | 1.10 | | >0.05 | 2.15 | | 11.3 | <0.001 |
| Experimental | Regulated identification | 3.10 | 0.63 | | | 4.11 | 0.53 | | |
| | Regulated introjection | 3.28 | 0.59 | | | 4.09 | 0.80 | | |
| | External motivation | 3.32 | 0.62 | | | 4.15 | 0.74 | | |
| | A motivation | 3.34 | 0.74 | | | 4.26 | 0.52 | | |

For the control group, which did not receive the SDLMI intervention, there were minimal changes in the pretest and posttest scores for regulated identification, regulated introjection, external motivation, and amotivation. The t-tests revealed no significant differences for regulated identification ($T=1.53$, $p>0.05$), regulated introjection ($T=1.01$, $p>0.05$), external motivation ($T=0.10$, $p>0.05$), and motivation ($T=11.3$, $p<0.001$). This indicates that the traditional instructional approach in the control group did not lead to substantial shifts in the learners' perceived locus of causality.

In contrast, the experimental group, which underwent the SDLMI, exhibited noteworthy changes in their perceived locus of causality. The t-tests revealed significant differences for regulated identification ($T=4.11$, $p<0.001$), regulated introjection ($T=4.09$, $p<0.001$), external motivation ($T=4.15$, $p<0.001$), and motivation ($T=4.26$, $p<0.001$). These results suggest that the SDLMI had a discernible impact on the intermediate EFL learners' perceived locus of causality, fostering positive changes in regulated identification, regulated introjection, and external motivation while concurrently reducing motivation. In summary, the findings indicate that the implementation of the self-determined learning model of instruction (SDLMI) led to significant changes in the intermediate EFL learners' perceived locus of causality, emphasizing the effectiveness of this instructional approach in influencing the motivational and causal factors underlying the learning experiences of the experimental group.

6. Discussion

This study aimed to investigate the impact of the Self-Determination and Language Mindset Intervention (SDLMI) on intermediate EFL learners, focusing on three key dimensions:

autonomous motivation, self-efficacy, and perceived locus of causality. Against the backdrop of evolving paradigms in language education, the SDLMI, grounded in Self-Determination Theory (SDT) and drawing on insights from Social Cognitive Theory and the Zone of Proximal Development, offered a unique approach to instructional design (Ryan & Deci, 2002; Vansteenkiste et al., 2018). With a primary objective of promoting learners' autonomy, competence, and relatedness within the language learning context, the SDLMI served as the experimental intervention, contrasting with a traditional instructional approach in the control group. Through a meticulous analysis of pretest and posttest scores, the researchers observed a substantial increase in intrinsic, extrinsic, and autonomous motivation within the experimental group resonates with contemporary research, particularly the meta-analysis conducted by Howard et al. (2021). This meta-analysis underscores the pivotal role of motivation in academic outcomes and highlights the effectiveness of interventions grounded in Self-Determination Theory (SDT) in enhancing students' motivation levels. Moreover, recent works emphasize the importance of autonomy-supportive environments in language education, aligning with the SDLMI's emphasis on fostering learners' autonomy (Cheon et al., 2018). This convergence of findings suggests that instructional approaches rooted in SDT can effectively enhance students' motivation, leading to more sustained and meaningful engagement in the learning process.

Furthermore, the significant improvements in self-efficacy across various language domains align with Bandura's Social Cognitive Theory, which posits a reciprocal relationship between learners' beliefs in their capabilities and their actual performance (Bandura, 1997). The SDLMI's emphasis on mastery experiences and autonomous learning likely fostered this bidirectional relationship, empowering students to take ownership of their language learning journey and build confidence in their abilities. This finding is consistent with Alibakhshi et al. (2020), who explored the antecedents of English language teachers' teaching self-efficacy and highlighted the importance of mastery experiences in enhancing teachers' belief in their instructional efficacy.

Moreover, the outcomes align with recent studies on motivational profiles from a self-determination perspective, which underscore the importance of autonomy-supportive practices in promoting the internalization of extrinsic motivations (Vansteenkiste et al., 2009). By providing learners with opportunities to make choices, set goals, and regulate their learning process, the SDLMI may have facilitated the integration of external motivations into students' sense of self, leading to more sustainable and self-directed learning behaviors. This finding is further supported by the work of Guay et al. (2020), who applied SDT to occupational themes and found that motivation types predict self-efficacy, highlighting the interconnectedness of motivation and belief in one's capabilities.

Furthermore, the lack of significant changes in the control group underscores the unique impact of the SDLMI on motivational orientations and self-efficacy beliefs. Traditional instructional approaches often rely on external forms of motivation, such as rewards and punishments, which may not effectively engage students or foster deep learning (Reeve, 2013). In

contrast, the SDLMI prioritizes the fulfillment of students' psychological needs for autonomy, competence, and relatedness, creating a supportive and empowering learning environment conducive to intrinsic motivation and self-efficacy development. In summary, the findings of this study highlight the transformative potential of instructional approaches informed by Self-Determination Theory and Social Cognitive Theory in promoting autonomous, motivated, and proficient language learning among intermediate EFL learners. By emphasizing learners' autonomy, competence, and relatedness within the language learning context, the SDLMI offers a promising framework for educators seeking to cultivate engaged, self-directed, and successful language learners. This underscores the importance of adopting pedagogical approaches that prioritize students' psychological needs and empower them to take ownership of their learning journey, ultimately fostering a lifelong love for learning and academic success.

In conclusion, this study provides compelling evidence of the transformative impact of the Self-Determination and Language Mindset Intervention (SDLMI) on intermediate EFL learners. By focusing on autonomous motivation, self-efficacy, and perceived locus of causality, the SDLMI offered a unique and contemporary approach to instructional design rooted in Self-Determination Theory (SDT), Social Cognitive Theory, and the Zone of Proximal Development.

The significant increase in intrinsic, extrinsic, and autonomous motivation observed among the experimental group resonates with contemporary research, highlighting the pivotal role of motivation in language learning outcomes. Moreover, the improvements in self-efficacy across various language domains underscore the effectiveness of the SDLMI in fostering learners' belief in their capabilities and promoting mastery experiences. Theoretical support from Bandura's Social Cognitive Theory and recent studies on motivational profiles further validate the impact of the SDLMI on learners' motivational orientations and self-efficacy beliefs. Additionally, the lack of significant changes in the control group highlights the unique contribution of the SDLMI in enhancing learners' autonomy, competence, and relatedness within the language learning context.

7. Limitations and Suggestions for Further Studies

While this study sheds light on the impact of the Self-Determined Learning Model of Instruction (SDLMI) on middle school learners of English as a foreign language (EFL), several limitations should be considered. The generalizability of the results may be limited by the focus of the study on a specific group at Golestan University of Gorgan, Iran. Caution should be exercised when transferring the results to different cultural and linguistic contexts or performance levels. Furthermore, the relatively short duration of the SDLMI intervention raises questions about the sustainability of its effects over time. The study sample size is another limitation, and future research could benefit from larger and more diverse participant groups to improve external validity. Furthermore, the self-report nature of measurement instruments creates the potential for response bias, suggesting the need for a more comprehensive assessment approach, including observations

and performance tasks. Given these limitations, suggestions for further studies arise. Longitudinal research with an extended SDLMI intervention period could lead to a more nuanced understanding of learner development. Investigating the effectiveness of SDLMI in different cultural contexts and linguistic backgrounds is crucial for adapting the model to different educational environments. Comparative studies pitting SDLMI against other instructional approaches would offer insights into the relative effectiveness of different strategies. Augmenting quantitative data with in-depth qualitative analysis, such as interviews or focus groups, could uncover the nuances of learners' experiences with SDLMI. Furthermore, investigating the role of teacher training in successful SDLMI implementation is pivotal, highlighting the need for tailored professional development programs. Lastly, extending the study to include learners at different proficiency levels would enable a more nuanced exploration of SDLMI's impact on diverse language learner groups.



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