Exploring the relationship between informal learning activities and learning motivations among college students

Yuewei Shi

School of Education, Notre Dame of Maryland University, Maryland, USA.
Email: yshi@ndm.edu

ABSTRACT

Informal learning is a significant and widespread form of education among college students, occurring in various flexible learning environments. It encompasses different activities initiated by diverse motivational factors. This study aims to explore the relationship between informal learning activities and motivational factors among college students. A survey research method was employed, utilizing Lohman's Informal Learning Activities Survey and the Work Preference Inventory as instruments. The study involved 160 college students. Data analysis included independent t-tests, stepwise regression, and Pearson-product correlations. Results indicated that adult learners exhibit higher levels of informal learning activities compared to traditional college students. Additionally, students with higher intrinsic motivation tend to engage more in informal learning. Motivation related to challenges was also positively associated with informal learning activities. The findings suggest that college educators and practitioners should establish a variety of accessible learning resources both inside and outside the classroom to motivate students to participate in informal learning. Furthermore, understanding the psychological needs of adult and traditional students can aid educators in designing challenging discussions and assignments, thereby fostering greater engagement in informal learning activities.

Keywords: *College students, Higher education, Informal learning, Learning activities, Learning motivation.*

Highlights of this paper

- This study explored the relationship between informal learning activities and learning motivations, focusing on internal and external motivations among college students.
- Adult college students tend to engage in a higher level of informal learning compared to traditional college students.
- A higher level of intrinsic motivation leads to a higher level of informal learning, and the factor of challenge is internally associated with informal learning among college students.

1. INTRODUCTION

College students are one of the types of learners within the formal education system. This population refers to individuals enrolled in higher education institutions (National Center for Education Statistics, 2023). According to the U.S. Department of Education, the number of undergraduate students was 15.4 million, and this figure is projected to increase by 9% to 16.8 million by 2031. College students possess characteristics that distinguish them from other student groups. Arnett (1994) describes some of these traits, such as "accept responsibility for the consequences of your actions," "decide on beliefs and values independently of parents or other influences," and "establish a relationship with parents as an equal adult" (p. 302).

Age is a critical criterion that defines different types of college students. Age differences can divide undergraduate students into traditional college students and adult learners. A study by the National Center for Education Statistics (NCES) identified three characteristics to define nontraditional undergraduate students: 1) students who delayed enrollment in postsecondary education or attend classes part-time; 2) students who have dependents other than a spouse, are single parents, work full-time while enrolled, or are financially independent from their parents; and 3) students who did not receive a standard high school diploma or earned some type of certificate of completion (Choy, 2002). According to the U.S. Department of Education, in 2021, 34% of enrolled undergraduate students were aged 25 or older (National Center for Education Statistics, 2023).

In today's college classrooms, students are surrounded by diverse learning resources. Besides formal education or training, students have numerous learning options both inside and outside the classroom. Informal learning activities often occur in various environments, as their flexible learning formats meet the diverse needs of learners in different conditions. With its increasing prevalence, informal learning is becoming a complement to formal education (Carliner, 2012). According to data from an adult education survey, more than 54% of individuals aged 25-69 reported engaging in informal education (Hall, Jones, & Evans, 2022). In some sense, informal learning is recognized and accepted by learners across various educational settings.

Lohman is recognized as both a theorist and practitioner in the study of informal learning activities. Margaret C. Lohman (2006) developed the Informal Learning Activities Survey to examine learning motivation across different groups. Subsequently, to assess the instrument's validity and reliability, Lohman (2009) employed the survey to explore factors influencing the engagement of information technology (IT) professionals in informal learning activities. The Lohman (2006) survey has also been utilized by other researchers to investigate informal learning activities within educational settings. For instance, Giust (2013) discussed strategies for implementing informal learning in classroom environments by applying Lohman (2006)'s theory of informal learning activities. Similarly, Kyndt, Gijbels, Grosemans, and Donche (2016) also used Lohman (2006) the same survey to identify differences in informal learning activities between novice and experienced teachers.

Learning activities are triggered by learning motivations. Welschen (2014) defined learning motivation as the psychological process that provides individuals with energy, direction, and persistence to undertake desirable learning actions. Learning motivation can be reflected from both internal and external perspectives. Gullu, Sahin, and Kiziloglu

(2018) distinguish between internal and external motivations, where the job itself motivates and the environment motivates. Learning motivations generally enhance positive effects on learning performance and assist learners in achieving their learning goals.

When evaluating internal and external learning motivations, the Work Preference Inventory (WPI), created by Amabile, Hill, Hennessey, and Tighe (1994), was designed to study these motivations across different groups. Figen and Akdöl (2019) used the WPI to explore learning motivations among bank sector professionals. Additionally, according to the study of Achakul and Yolles (2013), the WPI was used to examine intrinsic and extrinsic motivations among potential employees. Furthermore, Stuhlfaut (2010) adopted the WPI to test working motivations among creative advising professionals. Additionally, Loo (2001) tested the validity and reliability of the WPI for student populations and demonstrated that the WPI is applicable to different student groups. To some extent, the Work Preference Inventory (WPI) is becoming a widely accepted instrument for assessing internal and external motivations.

2. LITERATURE REVIEW

The concepts of informal learning and learning motivations have been widely discussed in previous studies. The instruments related to informal learning activities and learning motivation have been studied in diverse populations, especially among working professionals, and in different settings.

2.1. Informal Learning

There are different ways to define or describe informal learning. Marsick and Watkins (2001) defined informal learning from the perspective of learning structures, and it involves intentional and non-highly structural learning activities such as task accomplishments, interpersonal interactions, sensing the organizational culture, and trial-and-error experimentation. From a comparative perspective of formal and informal learning, Galanis, Mayol, Alier, and García-Peñalvo (2016) defined formal learning as "the education received from a recognized education center that leads to a certification" (p. 596), whereas informal learning is self-initiated learning that incorporates an active approach in which learners actively give direction to their learning process (Lecat, Raemdonck, Beausaert, & März, 2019). From a learning motivational perspective, Cerasoli et al. (2018) described informal learning as self-initiated, intrinsically driven, individually controlled, and aimed at obtaining goals set by an individual learner, and introduced several informal learning behaviors such as observing a coworker, discussing a problem with a supervisor, and asking questions while on the job. These definitions not only summarize the learning structures and the comparisons with formal education but also highlight the characteristic of internal self-driving. Additionally, some researchers also explained informal learning from a perspective of learning place. According to the description from Kotys-Schwartz, Besterfield-Sacre, and Shuman (2011), informal learning could occur in everyday experiences and in designed and programmed settings. Similarly, Noe, Tews, and Marand (2013) also studied different types of learning activities and summarized some characteristics of informal learning, such as being learner-initiated, occurring on an as-needed basis, motivated by the intent to develop, involving action and reflection, and not occurring in a formal classroom setting.

The advantages of informal learning include the integration of learning autonomy and internally driven factors. College students benefit from informal learning, which fosters a culture of freedom and openness, encouraging student interactions, engagement, and independent study. (Berman, 2020). Informal learning shifts the ownership of knowledge from the teacher to the student, providing learners with greater autonomy in their learning process. (Feichas, 2010). As learners become the owners or controllers of their learning, informal activities should be

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motivated by various intrinsic factors. Song and Bonk (2016) identified key motivational factors such as freedom and choice, control, and interest or engagement, which drive students to learn in informal environments.

As more educators or practitioners realize the advantages of informal learning, informal learning activities have been incorporated into teaching in many different ways. For example, Figen and Akdöl (2019) discussed the integration of informal learning activities, such as social networks, blogs, and Twitter, into online course teaching. The increase in informal learning activities among college students has also brought about the issue of how to evaluate informal learning. Evans, Karlsven, and Perry (2020) observed and practiced different evaluation methods of informal learning and suggested competency (skills)-based evaluation supplemented by low-stakes assessments and self-reporting as a way to measure informal learning in the workplace and at school. In summary, college teaching and evaluation are affected by the prevalence of informal learning activities among college students.

2.2. Learning Motivation

There is a growing body of literature that discusses learning motivation. Learning motivation is primarily understood through Self-Determination Theory (SDT). SDT posits that "human beings are inherently active, with evolved tendencies toward assimilation, seeking and mastering challenges, and integrating new experiences" (Ryan & Deci, 2022). The theory emphasizes that humans have three basic psychological needs: autonomy, competence, and relatedness (Zhou & Li, 2023). Learning motivation can be categorized into intrinsic and extrinsic motivations based on different goal orientations. Intrinsic motivation refers to "doing something because it is inherently interesting or enjoyable," whereas extrinsic motivation refers to "doing something because it leads to a separable outcome" (Ryan & Deci, 2000).

The learning motivations based on Self-Determination Theory (SDT) can be measured and associated with various variables across different learning environments. For example, Noels, Clément, and Pelletier (1999) analyzed the relationship between teachers' communication styles and students' extrinsic and intrinsic motivations, revealing that a controlling communication style is negatively associated with students' intrinsic motivation. Additionally, learning motivations are closely linked to academic performance and achievement. Makki and Abid (2017) discussed the relationship between task performance and both intrinsic and extrinsic motivations, demonstrating that these motivations positively impact task performance. Similarly, Lei (2010) studied intrinsic and extrinsic motivations among college students and found that intrinsic motivation more effectively promotes student learning and achievement than extrinsic motivation.

2.3. Informal Learning and Motivation

When it comes to the relationship between informal learning and learning motivations, some researchers have discussed the factors or predictors that influence informal learning. Berg and Chyung (2008) examined the factors that influence informal learning and showed that interest in the current field and monetary rewards are intrinsic and extrinsic motivational factors. In addition, Song and Bonk (2016) also illustrate that self-directed informal learning is affected by freedom and choice, control and interest, and engagement. Santoro (2022) discovered the moderator of intrinsic motivation in an informal learning context and presented that mastery goal orientation positively relates to informal learning behaviors. Furthermore, motivation can be fostered and constructed through diverse methods. Paris (1997) summarized the pathway of forming intrinsic motivation in informal learning settings and stated that intrinsic motivation can be fostered through the construction of personal meaning, permitting choices, providing challenges, allowing personal control over learning, and inviting collaboration.

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3. PURPOSE OF STUDY

The existing research has highlighted the relationship between informal learning and learning motivations in the professional population or focused on fostering intrinsic and extrinsic motivations through different self-learning management methods. In particular, limited research exists on the relationship between informal learning activities and learning motivations, especially from both the internally self-driven motivations perspective and the psychological needs motivational perspective.

This study aimed to determine if differences in informal learning exist among college students and the relationship between informal learning and learning motivations. This study was guided by the following research questions.

1. What is the difference in informal learning by gender and age among college students?
2. What is the relationship between informal learning activities and intrinsic/extrinsic motivations among college students?
3. What is the relationship between informal learning activities and motivation factors among college students?

The understanding of college students having different learning motivations for informal learning activities would provide evidence to support educators in using different teaching methods or resources to engage and enhance diverse students to commit to their learning. It was also expected that this study would provide an evidence-based relationship model of informal learning and learning motivations and help educators and practitioners choose suitable strategies to motivate students to learn in an informal learning environment.

4. METHODS

For this study, independent *t*-test, stepwise regression, and Pearson correlation analysis were the statistical methods used to analyze the data. The differences in informal learning by age and gender were analyzed using an independent *t*-test. The relationship between informal learning, intrinsic motivation, extrinsic motivation, and motivational factor variables was examined. The predictors or dependent variables included intrinsic motivation, extrinsic motivation, and motivational factors such as enjoyment, challenge, outward, and compensation. The independent variable was informal learning.

4.1. Sample

The participants of this study were college students enrolled and studying at a southeastern higher education institution. The participants were recruited from two campuses. A total of 160 college students participated in this study and completed the survey. Participation was voluntary. Among these participants, 92 (57.5%) students were younger than 25 years old, and 68 (42.5%) students were 25 years old or older. Additionally, 89 (55.6%) students identified as male, and 71 (44.4%) identified as female.

4.2. Data Collection

Participants completed a demographic survey and two instruments in this study. The demographic survey collected gender and age information from the participants. The Informal Learning Activity Survey, developed by Lohman (2006), was used to measure informal learning. The Work Preference Inventory (WPI), developed by Amabile et al. (1994), was used to measure intrinsic motivation, extrinsic motivation, and motivational factors.

4.3. Instruments

The Informal Learning Activity Survey includes 8 different informal learning activities: Talk with Others, Scan Professional Journals and Magazines, Search Internet, Observe Others, Reflect on Actions, Trial and Error, Share Resources and Materials, and Collaborate with Others. Participants respond based on the level that most accurately reflects their frequency of engaging in each activity. Responses are recorded using a five-point Likert scale: 1=Never; 2=Rarely; 3=Sometimes; 4=Very Often; 5=Always. Each participant selects one response per item.

The Work Preference Inventory (WPI) is a self-reported questionnaire based on Deci and Ryan (1985) personal causation orientation theory. The instrument contains 30 components that are responded to by participants to indicate their perceptions. The responses to each question are based on a five-point Likert scale: 1=Never or almost never true for you; 2=Sometimes true for you; 3=Often true for you; 4=Always or almost always true for you. The instrument includes two primary scales (Intrinsic and Extrinsic motivations) and four secondary scales that examine four different motivational factors (Enjoyment, Challenge, Outward, Compensation).

5. RESULTS

5.1. Research Question 1: What is the Difference in Informal Learning by Gender and Age Among College Students?

To compare the differences in informal learning by gender and age, an independent *t*-test was conducted. The results, as shown in Table 1, indicated that a statistically significant difference was found between the group below age 25 and the group aged 25 years or older, $t = -2.33$, $p < 0.05$. No statistical significance was found between male and female students, $t = -1.09$, $p = 0.85$. In other words, college students aged 25 years or older have a higher level of informal learning intention.

Table 1. Comparison of informal learning differences by gender and age.

	Female		Male		$t(160)$	p
	$n = 71$		$n = 89$			
Informal learning	M	SD	M	SD		
	21.82	4.59	21.02	4.61	-1.09	0.85
	Below age 25		Age 25 or above			
	$n = 92$		$n = 68$			
Informal learning	M	SD	M	SD		
	20.68	5.01	22.31	3.84	-2.33	0.01*

Note: *$p<0.5$.

5.2. Research Question 2: What is the Relationship Between Informal Learning and Intrinsic/Extrinsic Motivations Among College Students?

A stepwise regression was conducted to explore the predictable relationship between informal learning and intrinsic/extrinsic motivations (see Table 2). The regression results show that the level of intrinsic motivation can predict informal learning. For each unit increase in intrinsic motivation, the intention of informal learning increases by 0.11. Intrinsic motivation has a positive relationship with informal learning. That is, college students with higher intrinsic motivation are more likely to adopt informal learning.

Table 2. Stepwise regression results.

Dependent variable	R^2	F	df	p	Predictors	b	t	p
Informal learning	0.04	3.48	2,158	0.03*	Intrinsic motivation	0.11	2.19	0.03*
					Extrinsic motivation	-0.09	-1.65	0.10

Note: *$p<0.5$.

5.3. Research Question 3: What is the Relationship Between Informal Learning and Motivation Factors Among College Students?

Person-product moment correlation analysis was used to examine if there was any statistically significant relationship between informal learning and motivational factors (Challenge, Enjoyment, Outward, and Compensation). The results are shown in Table 3. There was a positive correlation between informal learning and challenge. The results revealed that informal learning was positively affected by challenge.

Table 3. Pearson product correlations of measured variables for college students.

Variables	Informal learning	Enjoyment	Challenge	Outward	Compensation
Informal learning	--	0.125	0.163*	-0.089	-0.099
Enjoyment			0.543**	0.034	-0.048
Challenge				-0.196*	-0.020
Outward					0.249**
Compensation					--

Note: *$p<0.05$, **$p<0.01$.

6. DISCUSSION

The findings of research question 1 revealed that college students who are 25 years old or older have a higher level of informal learning activities than college students who are younger than 25 years old. Specifically, the frequency of engaging in informal learning activities among adult students is higher than the traditional college student group. This finding is aligned with the data showing that more than 90% of adults participate in some informal learning activities (Carliner, 2012). The research findings are consistent with the evidence from studies related to adults engaging in active learning outside of formal settings and utilizing informal learning activities more often (Pihlainen, Korjonen-Kuusipuro, & Kärnä, 2021; Sullivan, 2023).

The findings of research question 2 indicated that informal learning activities are associated with internal motivation. This research finding aligns with the notion that internal motivation has direct effects on both undergraduate and graduate students' learning (Wang, Wei, Lin, Wang, & Wang, 2024). Moreover, the findings of research question 2 also reflect the evidence from Zadaa and Zahoor-ul-Haqb (2022) study, which shows that informal learning not only assists students' learning in formal education settings but also motivates students to engage in deep learning. This significant relationship indicates that informal learning activities are highly guided by internal motivations among college students.

The findings of research question 3 indicate that informal learning activities are associated with challenges. In a rapidly changing environment, learning challenges are becoming more diverse and complex. To adapt to this new learning environment, students need to participate in activities that help them acquire knowledge or skills through experience, action, feedback seeking, and reflection (Park, Li, & Luo, 2021). Reflecting on these findings, internal awareness of challenges enhances the motivation to engage in informal learning activities among college students.

7. IMPLEMENTATIONS

Recommendations include providing college educators and practitioners with an introduction to informal learning activities and training about improving intrinsic motivation in college teaching. Traditional college students and adult learners respond to informal learning differently, which encourages educators to adopt different types of instructional strategies in their teaching. In order to encourage college students to engage in informal learning activities, a variety of methods that involve establishing a variety of learning resources and understanding psychological needs could be applied to stimulate the intrinsic motivation among college students.

Educators and practitioners play a significant role in engaging college students in informal learning. Therefore, accessible informal learning resources such as shared repositories, libraries, websites, and webinars should be provided by instructors to encourage students to explore and try new things (Moore & Klein, 2020). The availability of fruitful informal learning resources outside the classroom offers students more options for flexible and accessible learning.

The impact of age differences on the acquisition of new domain knowledge is influenced by prior knowledge and ability (Beier & Ackerman, 2005). According to the study by Vermeylen and McLean (2014), adult learners are more likely to define explicit learning goals and engage deeply in learning processes in informal settings. Additionally, adult learners tend to adopt study plans to achieve their learning goals (Okagbue et al., 2020). Conversely, traditional college students appear less motivated due to missing important aspects of a topic, learning in an ad hoc manner, and having difficulty assessing their learning (Boustedt et al., 2011). Therefore, traditional college students may require motivation through various strategies related to informal learning. Significant research indicates that intrinsic motivation is closely related to students' psychological needs: competence, autonomy, relatedness with classmates, and relatedness with the instructor, based on self-determination theory (Goldman, Goodboy, & Weber, 2017; Zhou & Li, 2023). The proposed motivational strategies from instructors should address these four needs. Since challenges are associated with informal learning, the teaching content or informal learning resources provided by instructors could help students perceive challenges in their informal learning and enable them to utilize their learning capacity to find and solve problems (Deci & Ryan, 1985). For autonomy, it is necessary for instructors to guide students in effectively utilizing learning resources or methods to find solutions to problems in their informal learning process. Lastly, intrinsic motivation aims to foster connectedness between students and instructors. In addition to providing accessible learning resources and instructing students on effective learning in informal settings, instructors or educational practitioners should encourage students to communicate and share their learning experiences. Peer information exchange and encouragement can influence students' motivation in informal learning. Similarly, establishing a connection between instructors and students can also motivate students during informal learning activities.

8. CONCLUSIONS

Based on this study, college students aged 25 or older demonstrate a higher level of informal learning than students who are younger than 25 years old in college. The internal motivation and the internal factor of challenge both contribute to learning activities among college students. The findings indicated that as intrinsic motivation and the level of informal learning increased among college students. In other words, a higher level of intrinsic motivation brought about a higher level of informal learning. Additionally, this study also illustrated that informal learning is positively correlated with the motivation factor of challenge among college students. For educators and practitioners, this research highlights that a range of motivational strategies should be employed to cater to the diverse learning characteristics and needs of different learners.

9. LIMITATIONS

There were several research limitations in this study. First, data used in this research was collected from one southeastern higher education institution. Second, this study only collected participants' age and gender information. Other variables, such as participants' ethnic groups and majors, may also affect their informal learning activities and learning motivations. Third, as this study used a self-reported questionnaire, such an instrument may be limited in that the participants may not completely understand their level of learning motivations and thus have difficulty

responding to certain questions. Lastly, since few studies have investigated informal learning activities as variables associated with the learning motivations of traditional and adult college students, this study is limited by available past research on the learners themselves.

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