# Role of Digital Media Self - Efficacy, Gender and Self - Directed Leaning on Cognitive Engagement among Young Adults: A Digital Gender Divide

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**Abstract:** *Cognitive engagement is identified to have a greater role in overall learning engagement. Digital Media Self Efficacy and Self - Directed Learning are two factors which seem to influence Cognitive engagement. In this study, the researchers have sought to understand the relationship between these factors and cognitive engagement among young adults. The study was carried out using descriptive research design from 200 graduates from different streams. From the results, the relationship between Digital media Self Efficacy and Self - Directed Learning Readiness on Cognitive engagement is significant.*

**Keywords:** Cognitive Engagement, Digital Media Self Efficacy, Self - Directed Learning Readiness

## 1. Introduction

Academic research has shown that cognitive engagement is an important field of education in academia, mostly within the field of educational psychology. Many higher education institutions are designing methods to assess student learning and development as evidence of the effectiveness of their academic programs. They typically view these assessments as low - stakes for the students because there are no consequences, regardless of how they perform. However, if institutions want to show what students are learning to stakeholders, students must be motivated to put forth effort on the test (Wise &DeMars, 2005). One factor that is less understood is the role that cognitive engagement plays in student effort. Newmann, Wehlarge, and Lamborn's (1992) definition of cognitive engagement, "the student's psychological investment in and effort directed toward learning, understanding, or mastering the knowledge, skills, or crafts that academic work is intended to promote" (p.12), is specific to academic work situations and is therefore relevant for assessment contexts. For example, students may put forth more effort on assessments that they find more cognitively engaging. Thus, assessment specialists may improve student effort by utilizing more cognitively engaging assessments. The study focuses on the Cognitive engagement among college students, to enhance academic outcomes such as engagement, class contribution, perseverance in the face of adversities towards academic successes. The purpose of the study is to analyze and estimate the influence of Digital Media Self Efficacy and Self - Directed learning Readiness on Cognitive Engagement among college students and also to study the influence of gender on the same.

## 2. Literature Review

### 2.1 Cognitive Engagement

The construct of cognitive engagement can be talked about in a myriad of ways. Appleton, Christenson, and Furlong (2008) reviewed several definitions of cognitive engagement and could classify the definitions into eight types: engagement, engagement in schoolwork, academic engagement, school engagement, student engagement, student engagement in academic work, student engagement in/with school, and participation identification. Measuring cognitive engagement during assessments would fall under the student engagement with the academic work subtype. Cognitive engagement in academic work has been defined by Marks (2000) as, "A psychological process involving the attention, interest, investment, and effort students spend in the work of learning" (pp.154 - 155). Newmann et al. (1992) defined cognitive engagement in academic work as, "The student's psychological investment in and effort directed toward learning, understanding, or mastering the knowledge, skills, or crafts that academic work is intended to promote" (p.12). Both definitions involve psychological investment and effort. The Newmann et al. (1992) definition is the more specific one stating that the construct involves engagement to master knowledge, skills, or crafts; whereas, Marks' definition does not address purpose for engagement. The definition used by the current study more closely aligns with Newmann et al. 's (12992) definition. We are most interested in students' psychological investment directed toward a specific academic event (assessment testing). Students may complete academic work and perform well without being engaged in mastery of material. In fact, a significant body of research shows that "students invest much of their energy in performing rituals, procedures, and routines without developing substantive understanding" (Newmann et al., 1992, p.12). Our understanding of cognitive engagement can be furthered by distinguishing

among behaviors as on a continuum between deep and shallow engagement (Greene & Miller, 1996). Students who exhibit behaviors that allow them to master academic work are seen to have deep cognitive engagement, while students who exhibit behaviors such as rote memorization and rituals they perceive will help them do well without developing mastery of the material are showing shallow engagement.

Cognitive engagement refers to students' cognitive investment in learning, including mental efforts directed toward learning, use of self - regulated strategies to learn and master concepts, and willingness to exert necessary efforts for comprehension of complex ideas (Corno & Mansinach, 1983; Zimmerman, 1990). These three components of school engagement are dynamically embedded within the individual and provide a rich characterization of how students act, feel, and think (Wang & Peck, 2013). School engagement is optimized when students perceive that the school context fulfils their needs for competence, autonomy, and relatedness (Connell & Wellborn, 1991; Deci & Ryan, 2000). **Competence** refers to the need to experience oneself as effective in one's interactions with the social environment (Elliot & Dweck, 2005), and a student's need for competence is fulfilled when they know how to effectively achieve desired outcomes (Skinner & Belmont, 1993). **Autonomy** refers to the extent to which an individual experiences oneself as the source of action. Autonomy is supported when a student perceives schoolwork as relevant to his or her interests and goals or when a student experiences choice in determining his or her own behaviour (Assor, Kaplan, & Roth, 2002). Finally, **Relatedness** refers to the need to experience oneself as connected to other people (Connell & Wellborn, 1991). Fulfilment of the need for relatedness is likely to occur when teachers and peers create a caring and supportive environment. Expectancy - value theory provides a theoretical foundation for a mediational model that links school characteristics to school engagement and performance through student motivational beliefs (i. e., academic self - concept and subjective task values).

The degree to which students are able to take on the learning activity is referred to as cognitive engagement. This includes how much time and effort pupils are willing to put into completing the activity. According to Clarke (2002: 133), cognitive engagement refers to the thinking that students conduct when working on an academic task. It signifies that student are engaged in a learning assignment that connects their thoughts and knowledge in the classroom. Cognitive engagement is conceptualized in the learning and instruction literature as the psychological investment students make towards learning—which ranges from memorization to the use of self - regulatory strategies to facilitate deep understanding (Fredricks et al., 2004). Irrespective of pedagogical strategies, research shows that meaningful learning is predicated on quality cognitive engagement (Guthrie et al., 2004; Smith, Sheppard, Johnson, & Johnson, 2005). In fact, cognitive engagement is at the hallmark of the Seven Principles of Good Practice in Undergraduate Education (Chickering & Gamson, 1987). Among other things, Chickering and Gamson's seven principles, which include active learning and contact between students and faculty, emphasize the importance of cognitive engagement

to learning. Deep cognitive engagement has been linked directly to achievement (Greene, 2015). To increase cognitive engagement, students must move from shallow cognitive processing to meaningful cognitive processing (Craik & Lockhart, 1972).

## 2.2 Digital Media Self Efficacy

Self - efficacy, according to Pajares (1997), is the assessment of one's ability to accomplish a specific task. The impact of self - efficacy on children' school experiences, including performance, participation, and achievement, is significant. A student's perceived self - efficacy can influence his or her motivation in academics, how academic stressors are managed, cognitive competency growth, achieved achievement, and the impact of skills on performance (Bandura, 1997; Carroll et al., 2009; Galyon, Blondin, Yaw, Nalls, & Williams, 2012; Kennedy, 2010; Lerdpornkulrat, Koul, & Sujivorakul, 2012; Williams & Williams, 2010). Self - efficacy supports the ability to set and achieve academic goals, as well as academic fulfilment (Pajares, 1997; Schunk, 2003). Self - efficacy and service learning have also been linked in previous study (e. g., Reeb et al., 2010).

Bandura's social cognitive theory (SCT) (e. g., Bandura 1977, 1986, 2011) provides a theoretical framework for analysing thinking, motivation, and behaviour, and so seems well suited to the study's goal. Personal, behavioural, and environmental forces, according to this hypothesis, influence human behaviour in general. Individuals interpret the results of their performance attainments in a given way in reciprocal determinism, which in turn influences and modifies their environment and self - beliefs. This, in turn, informs and influences subsequent behaviour. Self - efficacy, defined by Bandura (1986, p.391) as "people's judgement of their skills to organise and execute courses of action required to achieve designated sorts of performances, " is a key component of the SCT. The stronger a person's self - efficacy believes, the more effort they will put into an activity, the longer they will persevere when faced with challenges, and the more resilient they will be. They will show their worth in the face of adversity (Pajares 1996, p.544). Academic self - efficacy beliefs arebased on students' perceptions of their skills to attain a certain objective, such as finishing a course or passing an exam, in the context of higher education. This may influence the amount of time they devote to learning activities in order to achieve their objectives.

Zawacki - Richter et al. conducted surveys on digital media usage with 2339 students in 2012 and 1327 students in 2015 from multiple HEIs that provided online courses and study programmes at the time (Zawacki - Richter et al.2017). In 2012, only 56% of students had a smartphone, 86% had a laptop, and 9% had a tablet; by 2015, 91 percent of students had a smartphone, 92 percent had a laptop, and 40% had a tablet (Zawacki - Richter et al.2017). Between 2004 and 2015, the EDUCAUSE Center for Analysis and Research (ECAR) studied undergraduate students and IT, based on 4123 students in 2004 to 50, 274 students in 2015 from higher education institutions in the United States and up to 15 other countries (Dahlstrom et al.2015). In both the

business and academic sectors, those studies have revealed a similar increase in the diffusion of technology and the use of mobile devices over time (Dahlstrom and Bichsel 2014). In reference to the HE context, academic self - efficacy beliefs are based on students' perceptions of their abilities to achieve a certain goal, e. g., to complete a course or to pass an exam. This may deter mine their learning effort that is spent on the activities to reach such goals. Self - efficacy expectations and behaviour in academic settings may also be linked to students' success of integration at a higher education institution (HEI). In line with the 'model of institutional departure' by Tinto (1993), the failure to become or remain incorporated in the intellectual and social life of the institution is one of three crucial factors for student dropout, in addition to academic difficulties and the inability of individuals to resolve their educational and occupational goals. the academic system, incorporation in social life refers to students' social integration. Both integration aspects depend on the terms determined by the HEI such as the course of studies as well as on external factors such as the social background. Although Tinto focusses on the identification of courses of action for HEI to reduce student dropout, the model and especially the aspect of integration may in combination with self - efficacy expectations and other non - cognitive factors, such as goal orientation, be appropriate to describe reasons for academic achievement and behaviour in academic settings as well.

### 2.3 Self –Directed Learning

Self - directed learning (SDL), according to Levett - Jones (2005), is an educational idea that has gotten a lot of attention in recent years, especially in higher education. Self - directed learning, according to Knowles (1975), is a process in which individuals, with or without the assistance of others, diagnose their learning needs, formulate learning goals, identify human and material resources for learning, select and implement appropriate learning strategies, and assess learning outcomes.

The concept of self - directed learning preparedness, according to Fisher, King, and Tague (2001), evaluates the degree to which the self - directed learner takes personal control and accepts the freedom that comes with studying what is essential to them. The learner's level of control is determined by his or her personality traits, attitudes, and abilities. According to Wiley (1983), self - directed learning readiness is described as the degree to which an individual's attitudes, abilities, and personality characteristics are conducive to self - directed learning. A number of assumptions about SDL preparedness are listed here. First, there is the premise that adults are naturally self - directed, implying that SDL readiness is a continuum with various degrees of preparation in each individual. Second, developing self - direction skills is difficult. Learning and practising autonomous conduct is the most effective technique to comprehend and demonstrate self - directed behaviour. The third assumption is that the capacity to practice SDL in one environment and setting may be transferred to other settings and situations. This may be the most difficult aspect of defining SDL ready, because high degrees of SDL preparation may not always translate to unexpected environments and circumstances (Fisher et al., 2001).

As previously stated, SDL preparedness is seen as highly personalised and representative throughout the continuum. As a result, data suggests that students with low SDL preparedness who are then given an SDL assignment experience high anxiety level equivalent to those experienced by learners with high SDL readiness who are exposed to environments with enhanced structure and instructor guidance (Fisher et al., 2001; Wiley, 1983). Adult learners value self - directed learning methods, skills, and systems over assessments and material covered when it comes to learning (Brookfield, 1984). Individuals are expected to initiate personal challenge activities and develop personal qualities that will enable them to successfully complete the activities (Caffarella, 2006). In this regard, self - directed learners show a greater awareness of their duty for self - monitoring as they strive to make learning meaningful. They have an insatiable need to learn new things by experimenting with and exploring new regions, concepts, and talents. As a result, they see obstacles as challenges, love learning, and want to improve, implying that self - directed adult learning necessitates increased motivation, tenacity, independence, self - discipline, self - confidence, and a goal - oriented mindset (Abdullah, 2007). As a result, there exist standards for establishing preparedness levels.

Self - discipline, autonomy, effective organisation, effective communication, acceptance of constructive feedback, self - reflection, and self - evaluation, according to Merriam (2002), are all components of self - directed learning preparation. To ensure successful independent study, self - directed learning (SDL) necessitates a variety of abilities and attitudes. As a result, students must assess their current circumstances, social networks, study habits, and familial conditions (Caffarella, 2006). The degree to which an individual has the attitudes, abilities, and personality qualities required for self - directed learning is defined as self - directed learning readiness (Wiley 1983, p.182). Several assumptions concerning SDL readiness are included in this definition. To begin with, adults are essentially self - directed, which means that preparation for SDL is a continuum that occurs across individuals to some degree. Second, self - direction competences can be cultivated to some level, and the greatest method to learn independent conduct is to do so. Finally, the ability to learn on one's own in one circumstance or context can be transferred to other situations (Candy 1991, Guglielmino 1989).

The SDLRS, according to Guglielmino (2008), is the most widely used instrument forassessing individual views of the attitudes and skills related with SDL. The scale is built around eight key characteristics that take into account both personality and behaviour. Instrument to Assess Self - Directed Learning Readiness (SDLRS)

## 3. Objectives of the Study

This study aims to examine various factors like stress tolerance, procrastination and learning styles in relationship to the academic engagement among college students with the following specific objectives:

- To analyze whether there is any significant relationship between Digital Media Self Efficacy and Cognitive engagement.
- To analyze whether there is any significant relationship between Self Directed learning readiness and Cognitive engagement
- To examine the role of Gender in the relationship between Digital Media Self Efficacy, Self - directed learning readiness and Cognitive engagement.

## 4. Methodology

The study targeted college students. A sample of 228 college students has been used for the study. The standardized Cognitive engagement scale for students is used. The scale has 7 items. The digital media self - efficacy was measured using a scale containing seven items adapted from the 2015 PISA (Reiss, Salzer, Schiepe - Tiska, Klieme, & Koller, 2016). The self - directed learning readiness is measured by the SDLR scale is used. The scale has 30 items. There are three dimensions self - management, desire for learning and self - control It was developed by Fisher, M. J., &King, J. (2010). The tool used was a structured questionnaire and the data collected was analyzed using statistical tools. Judgmental Sampling was the technique used in this research.

## 5. Results & Interpretation

The Fig.1 shows the research model with the relationship between the latent variables and the indicators used to measure the variables. The 'R' shown in parentheses inside the latent variable indicates whether the latent variable is reflective or not. The number of indicators used to measure each latent variable and the indicators are also shown along with the variable label.
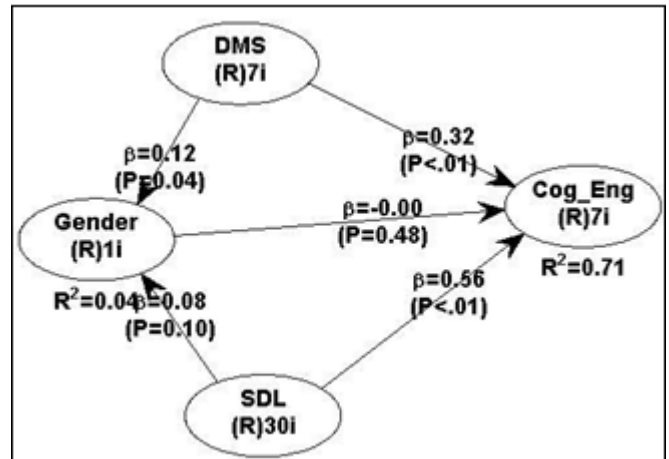


**Figure 1:** Structural Model with β and R2 values

The models in PLS are estimated by loadings or weights, which describe how the observations relate to the unobservable variables. The structural relationships explain how the values of unobservable variables influence values of other unobservable variables in the model. The general results of the SEM analyses are as shown in table. All the criteria for model fit are, as shown in table, are satisfied by the model.

**Table 1:** Model Fit Indices

| Measures | Threshold Values/ P value Observed | Measures Threshold Values/ P value Observed |
|---|---|---|
| Average path coefficient | | 0.216, P<0.001 |
| Average R - squared (ARS) | | 0.371, P<0.001 |
| Average adjusted R - squared (AARS) | | 0.365, P<0.001 |
| Average block VIF (AVIF) | acceptable if <= 5, ideally <= 3.3 | 2.667 |
| Average full collinearity VIF (AFVIF) | acceptable if <= 5, ideally <= 3.3 | 2.997 |
| Tenenhaus GoF (GoF) | small >= 0.1, medium >= 0.25, large >= 0.36 | 0.501 |
| Sympson's paradox ratio (SPR) | acceptable if >= 0.7, ideally = 1 | 0.999 |
| R - squared contribution ratio (RSCR) | acceptable if >= 0.9, ideally = 1 | 1.00 |

The estimated model with path coefficients and corresponding p - values in the parentheses are provided in table III and fig 1. In warp PLS, path coefficients are referred to as beta (β) coefficients. The explanatory power of the structural model is evaluated by examining the squared multiple correlation ($R^2$) value of the dependent constructs. The R square coefficient measures the percentage of variation that is explained by the model.

**Table 2:** ($R^2$) value and adjusted $R^2$

| | Cog_Eng | DMS | SDL | Gender |
|---|---|---|---|---|
| R - squared coefficients | 0.706 | | 0.036 | |
| Adjusted R - squared coefficients | 0.702 | | 0.028 | |

**Table 3:** Path Coefficients and (P Value)

| Path Coefficients and (P Value) | | | | |
|---|---|---|---|---|
| | Cog_Eng | DMS | SDL | Gender |
| Cog_Eng | | 0.318 P<0.001 | 0.560 P<0.001 | - 0.003 P=0.483 |
| Gender | | 0.116 | 0.083 | |

**Table 4:** Effect size for path coefficients

| Effect size for path coefficients | | | | |
|---|---|---|---|---|
| | Cog_Eng | DMS | SDL | Gender |
| Cog_Eng | | 0.247 | 0.459 | 0.000 |
| Gender | | 0.021 | 0.015 | |

Effect sizes for path coefficients for each path coefficients are given in table. An **effect size** is a quantitative measure of the strength of a relationship (Preacher & Kelley, 2011). Effect size indicates how much change the dependent

variable can be explained by independent variable. The effect sizes described in warp PLS are similar to Cohen's (1988) f - square coefficients. The effect sizes help to determine whether the effects indicated by path coefficients are small (0.02), medium (0.15), or large (0.35) (Cohen et al., 2003). From table, it is clear that the relationship between Digital media Self Efficacy and Cognitive Engagement is significant and the relationship between Self Directed Learning Readiness and Cognitive engagement is also significant. The relationship between Gender and the variables are not found to be significant except for its relationship with digital media self - efficacy. The effect size shows that the relationship between Digital media self - efficacy and cognitive engagement is medium, the relationship between SDL and cognitive engagement is large. The model fit indices indicate that the model is fit the effect sizes are large and medium.

## 6. Conclusion

Cognitive Engagement in educational programs upsurges the attention and concentration, motivates students to practice high critical thinking, and encourages learning experiences. This study tries to recognize the significance of Cognitive engagement and the various factors affecting it. The major objective of the study is to understand the influence of Digital Media Self Efficacy and Self Directed learning on Cognitive engagement of college students. The results indicate that both the relationships were statistically significant. Among the variables, Effect size of Digital media self - efficacy and cognitive engagement is medium and the relationship between SDL and cognitive engagement is large. Therefore, increasing digital media self - efficacy and self - directed learning readiness will help to increase cognitive engagement which is essential for academic success.

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