



Original Article

Intellectual Intelligence and Learning Experience Have No Effect on the Self Directed Learning Readiness of Students on the Medical Education Study Program

Salwa Khairun Nisa¹, Lutfi Rachman², Marindra Firmansyah³✉

^{1,2,3}Faculty of Medicine, Universitas Islam Malang, Indonesia.

Correspondence Author: marindraf@unisma.ac.id✉

Abstract:

Self directed learning readiness has an important role in determining student academic achievement. The analysis of intellectual intelligence and learning experience as affecting factors on self directed learning readiness of medical education students on University of Islam Malang is still unknown, therefore it needs to be researched for the better educational development strategies. The University of Islam Malang's Faculty of Medicine conducted cross-sectional descriptive analytic research with 174 eligible students as a sample. The Intelligenz Struktur test was used to assess IQ. The sum of the semester credit hours was used to examine the test and learning experiences. A questionnaire called the Self-Directed Learning Instrument was used to gauge the level of preparedness for self-directed learning. A p-value less than 0.05 was deemed significant when the data was examined. Out of 135 pupils, 77.6% were very prepared to learn independently, whereas 2 students, or 1.1%, were not at all prepared. Kids with high IQ were shown to be 1.1% prepared to learn independently, but kids with low IQ were not at all prepared to do so. Of the pupils surveyed, 63 had high levels of learning experience (46.7%) and 72 had low levels of it (41.4%), indicating a high level of self-directed learning preparation. According to the spearman correlation test, there is a weak link between self-directed learning readiness and both intellectual intelligence and learning experience ($r = -0.088$ and $r = -0.023$, respectively). Results from the ordinal logistic regression test showed that IQ had no significant effect on self-directed learning readiness ($p = 0.206$) and that prior learning experience had no effect on self directed learning readiness ($p = 0.855$). Intellectual intelligence and learning experience have no effect on students' self directed learning readiness.



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Keywords: Intellectual Intelligence, Learning Experience, Self Directed Learning Readiness.

Introduction

The change in the learning system at the Faculty of Medicine in Indonesia from teacher-centered learning to student-centered learning has a great impact on learning outcomes ([Akbar et al., 2021](#)). Problems that arise such as lack of initiative in independent learning, mistakes in understanding independent learning, and lack of responsibility for learning. Therefore, in order for students to be able to adapt to the changes in the system that appear over time, students who have the readiness to learn independently are needed ([Nyambe et al., 2016](#)).

Self Directed Learning Readiness is defined as an attitude in independent learning which consists of components of traits, skills and personal characteristics. Previous research shows that readiness in independent learning continues to increase as the years increase in learning. However, interviews with students of the Faculty of Medicine, University of Islam Malang in 2023 still show complaints related to the readiness of independent learning, one of which is about the lack of motivation in studying and students who only study when they are in a good mood ([Faridah et al., 2024](#)).

In terms of self-adjustment, self directed learning readiness affected by several factors, including intellectual intelligence and learning experience. Learning experiences have an important role in changing behavior through interaction with the environment, helping students understand learning, regulating the learning process, knowing learning styles and strategies, and managing learning time better ([Nurcahyandi & Purwaningrum, 2022](#); [Simbolon & Silalahi, 2019](#)). Intellectual intelligence also has an impact on the readiness of independent learning which includes the ability to understand, analyze, process information, think critically, and solve a problem. Students with good intellectual intelligence tend to be more confident and effective in independent learning ([Ab, 2020](#); [Gardner, 2003](#); [Putra & Dewantoro, 2022](#)).

The Faculty of Medicine in University of Islam Malang is a medical education institution that wants to produce competent doctors by applying the Problem Based Learning learning method. This method determines the active role of students in conducting independent learning so that students are expected to have a good readiness for independent learning in order to meet the expected competency targets ([Firmansyah, 2016](#)).

This study aims to increase knowledge in literature by observing how far intellectual intelligence and learning experience can influence students' self directed learning readiness. Another motivation for the study was the researchers' interest in further investigating the ways in which students' IQ and prior knowledge affect their readiness to learn independently. Better teaching tactics are expected to be developed based on the expected results of this research.

Methods

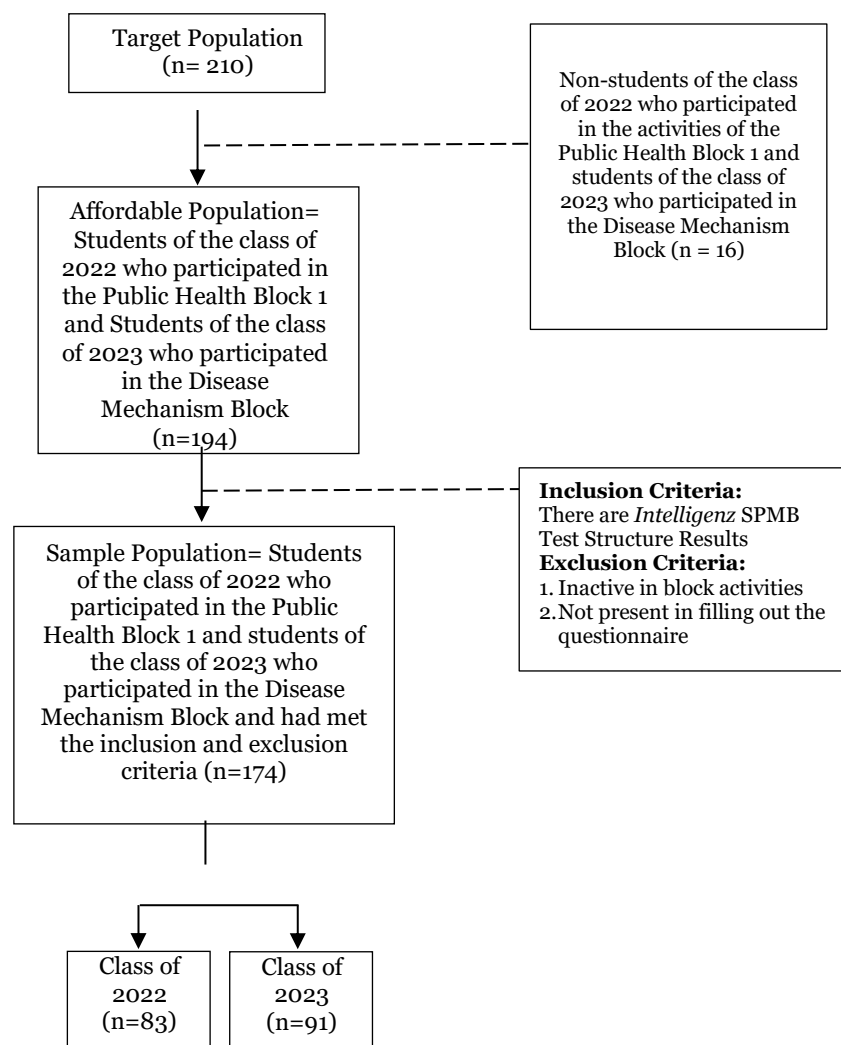
Research Design, Time, and Place of Research

"This study uses an analytical descriptive design and uses a quantitative approach through the cross-sectional method. This research was carried out at the Faculty of Medicine, University of Islam Malang from April 2023 to January 2024. The approval for this research has been given with certificate No.070/LE.003/VII/01/2023 from the Health Research Ethics Commission of the Islamic University of Malang on July 11, 2023 and is still valid today."

Data Acquisition

The data collected came from the results of filling out a questionnaire from instruments that were valid and reliable. The questionnaire is distributed to respondents through Google Forms and filled out simultaneously in the same location. This is so that informed consent can be given directly, and respondents' questions about the questionnaire can be answered by the researcher.

The purposive sampling technique is used so that the concentration of respondents in filling out the questionnaire can be observed and so that the fulfillment of the inclusion criteria of respondents consisting of FK Unisma students of the class of 2022 who participated in the Public Health Block 1 activities and the students of the class of 2023 who participated in the Disease Mechanism Block activities can be managed directly by the researcher. Meanwhile, the exclusion criteria for this study include FK Unisma students of the 2022 and 2023 batches who are deactive in block activities, do not attend questionnaire filling activities, and do not have Test Structure Intelligence scores.



The next data used in this study is the data from the Intelligenz Test Structure to measure students' intellectual intelligence and data on the number of credits taken to measure student learning experience.

Measurement of Intellectual Intelligence

The intellectual intelligence measurement tool used in this study is the result of the Intelligenz Test Structure which was carried out during the New Student Admission Selection (SPMB) of FK Unisma Students. Intelligenz Test Structure is an intellectual intelligence test tool containing 9 subtests aimed at revealing the general intelligence value and specific ability value that each individual has ([Kumolohadi & Nia, 2012](#)).

The data from the results of the Intelligenz SPMB Test Structure for FK Unisma Students is in the form of data in the form of a stratified adjective category which is then coded by the researcher into numerical points with details of point 1 for the "very low" category, point 2 for the "low" category, point 3 for the "moderate" category, point 4 for the "high" category and point 5 for the "very high" category.

Learning Experience Measurement

The measuring tool of learning experience used in this study is the number of credits taken by students. The Semester Credit System (SKS) is an assessment system for the achievement of student learning experiences in the context of the educational process that is passed ([Abi Sholeh, 2023](#)).

The data on the number of credits taken by students is in the form of numerical scores with varying nominals which are then converted by the researcher into two categories of traits, namely the "low" category and the "high" category where the category determination is obtained from the mean score of the number of credits, which is 61. From this mean, the score range of the number of credits in the "low" category and the "high" category is determined. Furthermore, the data researcher coded into numerical points with details of point 1 for the "low" category and point 2 for the "high" category.

Measurement of Self Directed Learning Readiness

Self Directed Learning Instrument is a questionnaire containing 20 statement items on a likert scale aimed at assessing the level of student learning readiness ([Hussain et al., 2019](#)). The results of filling out the questionnaire were summed up all points per item from each respondent which then the total points were divided into three categories which were then coded by the researcher into numerical points with details of point 1 for the "low" category, point 2 for the "adequate" category and point 3 for the "high" category.

The validity and reliability test was carried out by testing the filling out of a questionnaire on 30 people outside the target population to ensure that the statements in the questionnaire were in accordance with the concept studied. The results of the validity test were obtained 19 out of 20 valid items with a significance value of <0.01 . Meanwhile, invalid items were eliminated and not included in the questionnaire distributed to the research respondents. The results of the reliability test were carried out after the elimination of invalid statements where Cronbach's alpha value of > 0.9 was obtained, indicating that all questionnaire items had excellent reliability.

Data Analysis Techniques

In this study, the SPSS version 25 application was used to test the correlation of

spearman, Chi-Square, and logistic regression to investigate the relationship and impact between variables.

Results

Results of Respondent Characteristics Analysis

The research was conducted on FK Unisma students of the class of 2022 who participated in the Public Health Block 1 and the class of 2023 who participated in the Disease Mechanism Block. In Table 1, it is explained that gender characteristics are dominated by female respondents and class characteristics are dominated by respondents of the class of 2023 with the results of the intellectual intelligence of the majority of respondents in the sufficient category. The majority of respondents' learning experience results are in the low category, while the majority of respondents' self-learning readiness results are in the high category.

Table 1. Characteristics of research respondents based on gender, year of study and age on research variables

VARIABLE		CHARACTERISTIC									
		Gender		Year Of Study		Age					
		Male (n=46)	Female (n=28)	2022 (n=83)	2023 (n=91)	16 (n=1)	17 (n=4)	18 (n=44)	19 (n=71)	20 (n=44)	21 (n=10)
Learning Experience	Low	47,8%	54,7%	100%	1,2%	100%	100%	88,6%	50,7%	20,7%	20,0%
	High	52,2%	45,3%	0,0%	98,8%	0,0%	0,0%	11,4%	49,3%	79,3%	80,0%
	Very Low	0,0%	1,6%	1,2%	1,1%	0,0%	0,0%	0,0%	1,4%	2,3%	0,0%
Intellectual Intelligence	Low	8,7%	7,0%	3,6%	11,0%	100%	0,0%	4,5%	11,3%	6,8%	0,0%
	Moderate	39,1%	43,0%	41,0%	42,9%	0,0%	0,0%	45,5%	33,8%	54,5%	40,0%
	High	34,8%	32,8%	36,1%	30,8%	0,0%	100%	40,9%	31,0%	20,5%	50,0%
	Very High	17,4%	15,6%	18,1%	14,3%	0,0%	0,0%	9,1%	22,5%	15,9%	10,0%
Self Directed Learning Readiness	Low	0,0%	1,6%	2,4%	0,0%	0,0%	0,0%	0,0%	1,4%	2,3%	0,0%
	Moderate	23,9%	20,3%	20,5%	22,0%	0,0%	0,0%	25,0%	18,3%	22,7%	30,0%
	High	76,1%	78,1%	77,1%	78,0%	100%	100%	75,0%	80,3%	75,0%	70,0%

Description: The learning experience is divided into low category and high category based on the number of credits taken with a low score if the credits taken < 61 and a high score if the credits taken > 61. Intellectual intelligence is divided into very low, low, moderate, high and very high categories based on the *Intelligenz Test Structure* score from SPMB FK Unisma.

Results of Correlation Analysis of Intellectual Intelligence and Learning Experience on Self Directed Learning Readiness

This study used the Spearman correlation test to evaluate the relationship between independent and dependent variables, identifying significance when the p-value was below 0.05. The correlation coefficient obtained from the correlation test shows whether there is a positive or negative relationship between the two variables. The positive value in the correlation results indicates that the stronger the correlation coefficient of the independent variable, the stronger the correlation coefficient of the dependent variable. Similarly, a negative result indicates that a lower correlation coefficient of the independent variable corresponds to a lower correlation coefficient of the dependent variable.

Table 2 shows that there is a positive relationship ($p > 0.05$) between IQ and school year as determined by Spearman's correlation analysis. Based on these results, there was a weak but statistically significant correlation between IQ and school level. This implies that increased cognitive intelligence often leads to improved educational experience. However, the relationship may be influenced by several other factors that are not mentioned in this study.

Table 2. Results of Correlation Analysis of Intellectual Intelligence with Learning Experience

IQ	LE		<i>p value</i>	Correlation Coefficient
	L (N = 92)	H (N = 82)		
VL	50,0 %	50,0%	$p = 0,449$	$r = 0,106$
L	76,9%	23,1%		
M	53,4%	46,6%		
H	50,0%	50,0%		
VH	46,4%	53,6%		

Description: The results of *spearman* correlation analysis on all research samples (N) on the variables of intellectual intelligence (IQ) with learning experience (LE) consisting of very low (VL), low (L), moderate (M), high (H) and very high (VH) categories. The correlation coefficient (r) and significant value (p) are displayed to assess how strong and significant the relationship between one variable and another variable.

In Table 3, the results of spearman correlation analysis are displayed, where the correlation coefficient between intellectual intelligence and learning experience and self directed learning readiness shows a negative value with a $p > 0.05$. This indicates that intellectual intelligence has a weak but not significant relationship with readiness for independent learning. In other words, increased intellectual intelligence and learning experience did not significantly increase self-study readiness. This is likely due to other factors that were not examined in this study.

Table 3. Results of Correlation Analysis of Intellectual Intelligence and Learning Experience with Self Directed Learning Readiness

IQ	SDLR			Correlation coefficient
	L (N=2)	M (N=37)	H (N =135)	
VL	0,0%	0,0%	1,5%	r = -0,088
L	0,0%	5,4%	8,1%	
M	0,0%	43,2%	42,2%	
H	100%	27,0%	34,1%	
VH	0,0%	24,3%	14,1%	
<i>p value</i>	<i>p</i> = 0,512			
PB	L (N=2)	M (N=37)	H (N =135)	Correlation coefficient
L	0,0%	54,1%	53,3%	r = -0,023
H	100%	45,9%	46,7%	
<i>p value</i>	<i>p</i> = 0,320			

Description: The results of *spearman correlation* analysis on all research samples (N) on the variables of intellectual intelligence (IQ) and learning experience (LE) with self directed learning readiness (SDLR) consisting of very low (VL), low (L), moderate (M), high (H) and very high (VH) categories. The correlation coefficient (r) and significant value (p) are displayed to assess how strong and significant the relationship between one variable and another variable.

Results of Analysis of the Influence of Intellectual Intelligence on Self Directed Learning Readiness

The purpose of this study is to test the relationship between IQ and self-study readiness using ordinal logistic regression. Table 4 provides an explanation of the findings from the ordinal logistic regression analysis regarding the impact of intellectual intelligence on the readiness of self directed learning, where intellectual intelligence data is measured from the results of the Intelligenz Test Structure that has gone through the coding process.

Table 4. Analysis Result of Intellectual Intelligence Affect on Self Directed Learning Readiness

Parameter Estimate	Wald	Sig. (<i>p value</i>)
Intellectual Intelligence	1,599	0,206

Description: Intellectual intelligence was measured by its influence on self directed learning readiness using ordinal logistic regression. An independent variable is declared to have a significant effect on the dependent variable if *the p value* is <0.05

In Table 4, the results of measuring the influence of intellectual intelligence on self directed learning readiness are shown with a significance value of 0.206 which can be interpreted as a *p value* greater than 0.05 which means that the intellectual intelligence variable does not have a significant effect on the self directed learning readiness variable as a dependent variable.

Results of Analysis of the Influence of Learning Experience on Self Directed Learning

Readiness

Ordinal logistic regression was used to analyze the influence of learning experience on self-learning readiness in this study. The results of ordinal logistic regression analysis of the influence of learning experience on self directed learning readiness are explained in Table 5 where the learning experience data is measured from the number of credits taken by students who have gone through the coding process.

In this study, ordinal logistic regression was used to analyze the influence of learning experience on self directed learning readiness. The results of the ordinal logistic regression analysis are presented in Table 5, where the learning experience is measured based on the number of credits that have been taken by students after going through the coding process.

Table 5. Analysis Result of the Learning Experience Affect on Self directed learning readiness

Parameter Estimate	Wald	Sig. (<i>p value</i>)
Learning Experience	0,033	0,855

Description: Learning experience was measured for its effect on self-learning readiness using ordinal logistic regression. An independent variable is declared to have a significant effect on the dependent variable if *the p value* is <0.05 .

Table 5 displays the results of measuring the influence of intellectual intelligence on self directed learning readiness, with a significance value of 0.855. This value shows that the $p \text{ value} > 0.05$, so it can be concluded that the learning experience variable as an independent variable does not have a significant influence on the self directed learning readiness variable which is a dependent variable.

Results of Analysis of the Influence of Intellectual Intelligence and Learning Experience on Self directed learning readiness

The magnitude of the influence on ordinal logistic regression is seen from the nagelkerke value on Pseudo R-Square. The magnitude of influence test is carried out to see how much one variable affects other variables.

Table 6. Analysis Result of the Intellectual Intelligence and Learning Experience Affect Percentage on Self Directed Learning Readiness

Pseudo R-Square	
Nagelkerke	0,014
Description: The value of <i>nagelkerke</i> is the influence of intellectual intelligence and learning experience on self directed learning readiness. The magnitude of the influence is measured by converting <i>the Pseudo R-Square</i> value to a percentage form that is 1.4%	

Table 6 shows that intellectual intelligence and learning experience have an influence of 1.4% on the self directed learning readiness. This means that the two variables only contributed 1.4%, while 98.6% were influenced by factors outside of this study.

Discussion

The Effect of Intellectual Intelligence on Self Directed Learning Readiness

In this study, it was found that the value of the influence of intellectual intelligence on the self directed learning readiness had a value of $p = 0.206$ and a value of $r = -0.088$ which indicates that intellectual intelligence does not have a significant effect and does not have a positive relationship with the self directed learning readiness.

Jensen's theory states that intellectual intelligence plays an important role in a person's readiness to learn independently, especially in understanding learning that lasts for a long period of time ([Jensen, 1989](#)). The findings of this study are in line with Wirabhakti's theory which states that the readiness to learn independently is only influenced by intellectual intelligence by 20%, while the remaining 80% is influenced by other factors ([Wirabhakti, 2019](#)). According to Febriza (2022), there is no significant difference in the self directed learning readiness among individuals with various levels of intellectual intelligence ([Febriza et al., 2022](#)). Another thing that can affect the relationship between intellectual intelligence and self directed learning readiness is the existence of socioeconomic factors, integrated support factors, self-confidence factors, and family influence factors ([Bayuningtyas et al., 2021](#); [Firdani et al., 2020](#)).

In this study, intellectual intelligence did not show a significant influence on the self directed learning readiness. One possible explanation is that IQ is not the only determinant of whether a student is ready to learn on their own or not. These results are in line with previous research that found a slight correlation between IQ and self-study readiness.

The Effect of Learning Experience on Self Directed Learning Readiness

"In this study, the value of the influence of learning experience on self directed learning readiness has a value of $p = 0.855$ and a value of $r = -0.023$ which indicates that learning experience has no significant effect and does not have a positive relationship with self directed learning readiness.

Vijayan argues in his research that students' self directed learning readiness is influenced by semester programs that improve their learning experience, with students' self-study readiness scores that continue to increase every semester ([Priya et al., 2016](#)). On the contrary, the results of this study are supported by the research of Panjaitan et al., which states that the difference in class level does not affect the readiness of students to learn independently ([Panjaitan & Isnayanti, 2020](#)). Other factors that can affect the relationship between intellectual intelligence and self directed learning readiness include gender factors, goal orientation factors, anxiety factors before exams and academic motivation factors ([Hunta et al., 2020](#); [Putri et al., 2020](#)).

In this study, learning experience did not show a significant influence on self directed learning readiness. This may be due to the fact that learning experiences are not the only factor that affects students' readiness for independent learning. These findings are in line with previous research that states that differences in grade levels do not have a significant impact on self directed learning readiness."

The Role of Respondent Characteristics in Research Results

"The characteristics of the respondents in this study are divided by gender and generation where it was found that female respondents and respondents of the class of 2022 had a higher self directed learning readiness than male respondents and

respondents of the class of 2023.

Based on the research that has been conducted, the readiness of independent learning can be influenced by gender. The study shows that women have better self-study readiness than men based on tutors' evaluations of students' individual learning motivations. Tutors assessed that women adapt faster to new learning environments compared to men ([Astuti, 2018](#)). However, this is contrary to another study that states that there is no significant difference in the readiness of independent learning between men and women when viewed from the characteristics of individual students.

Research conducted on students shows that the higher the student force, the higher their readiness for independent learning. The results of the study showed that fourth-year students had higher scores of self-study readiness compared to students of other levels ([Deyo et al., 2011](#)). This is different from research by Premkumar (2018) which states that the higher the batch, the lower the self directed learning readiness in students. The study measures the readiness of independent learning based on students' ability to understand learning rather than just memorizing the learning material ([Premkumar et al., 2018](#)).

Age can also affect the readiness of independent learning in line with previous research which stated that the sense of responsibility for individuals in learning will increase as they get older, which makes them more responsible in preparing themselves for independent learning ([Purnamasari et al., 2021](#)). This is contrary to the statement of Supardi (2016) which states that the readiness to learn independently is not limited by age because humans have their own opportunities to learn (Supardi, 2016).

The readiness for self-study with high value in this study was more often found in respondents with the female gender and was found to be higher in the higher generation. The older age in this study also showed a high readiness for independent learning. This can happen because the target population for this study sample is more female and this can also happen in line with previous research that women tend to be higher in terms of learning motivation compared to men. Self directed learning readiness is found to be higher in the higher generation and older age is likely to occur because students have more experience than previous learning so that they can prepare for learning better."

Disadvantages and Advantages of Research

There are a number of potential benefits and drawbacks to this study that can arise from a variety of factors, some of which are internal to the study participants and others are external. The advantage of this study is that the validity and reliability test process has been carried out on the questionnaire before being distributed to the research respondents, besides that direct observation can be made by the researcher in evaluating the reaction and situation of the respondents when filling out the questionnaire. In addition, this research can be used as literacy and reference for further research on the readiness of independent learning.

The disadvantage in this research is that the characteristics of the sample are less varied so that bias in the study can occur in data collection. In addition, the number between one sample and another sample is not balanced so that it is considered less representative of the entire FK Unisma student population.

Conclusion

The results and data analysis showed that the readiness of students of the medical

education study program, Faculty of Health, Unisma, to study independently did not have a significant correlation with their intellectual intelligence. In addition, previous learning experiences also did not show a significant influence on their readiness level in undergoing the independent learning process. This indicates that intellectual factors and previous academic experience are not the main determinants of students' readiness to face independent learning in the field of medicine.

In order to achieve better research results in the future, it is recommended that further research consider several other factors that may affect the readiness of independent learning, in addition to intellectual intelligence and learning experience that have been identified in this study. It is also recommended to ensure that data collection is carried out in a balanced manner, paying attention to the characteristics of the respondents being studied. In addition, it is important to select research samples with clear differences in characteristics to provide more representative and relevant results in the analysis of self directed learning readiness.

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