Pedagogy-Andragogy Continuum with Cybergogy to Promote Self-Regulated Learning: A Structural Equation Model Approach

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Abstract: The increasing sophisticated learning technology and COVID-19 have pushed the teaching-learning process to use pedagogy, andragogy, and cybergogy approaches. The current research aims to investigate the relationship between the practices of these three approaches and student self-regulated learning. The structural equation model used indicates that pedagogy practices may affect the andragogy practices in teaching-learning process. Pedagogy approach shows no direct effect but has an indirect effect on students' self-regulated learning. The indirect effect comes from the pedagogy-andragogy continuum and the impact of pedagogy instruction on cybergogy practices. Andragogy practices also gives a significant impact on students' self-regulated learning and how the students use learning technology in cybergogy approach. Andragogy and the continuum of cybergogy promote students' self-regulated learning. These results indicate that pedagogy-andragogy continuum can have an interplay with cybergogy. The interplay of these approaches may encourage students' self-regulated learning. The current research can be a baseline to construct a new approach in teaching-learning process and its instructions in the classroom.

Keywords: *Andragogy, continuum, cybergogy, pedagogy, self-regulated learning.*

Introduction

Online and distance learning has been applied in school closure situation in order to restrain the spread of COVID-19. Teachers have adapted to the pandemic condition of COVID-19 by changing the learning foundation in the COVID-19 quarantine situation (Deineha et al., 2020). This extreme situation has pushed teachers to develop their skill in using technology and meet the minimum technical requirements to use learning technologies such as Zoom, Webex, and Microsoft teams (Collazos et al., 2021). Teachers and students should also be prepared to shift the teaching-learning process from the conventional approach of pedagogy to andragogy.

Andragogy is adult education and learning (Jones et al., 2019; Loeng, 2018; Wozniak, 2020). Even though andragogy is for adult learning, effective instructions for children can also be gained through andragogy (Knowles, 1989). Andragogy and pedagogy have a clear relationship and share common attributes and values that fit into each other practices (Bowling & Henschke, 2020; Jeanes, 2021). Practically, mixing both approaches is possible. The interplay between pedagogy and andragogy in learning has been practiced in entrepreneurship education (Jones et al., 2019; Neck & Corbett, 2018; Santini-Hernández, 2022), teacher education (Diacopoulous & Butler, 2021; Kasozi, 2009), and school student learning (Adebisi & Oyeleke, 2018). The interplay between pedagogy and andragogy also meets the student-centered learning especially for students at high school level.

Third-year students in Indonesian vocational high schools are generally 18 years old, who can be regarded as the early phase of emerging adulthood. The emerging adulthood phase is a phase when adolescents have an age range from 18 to 25 years old (Arnett, 2000, 2007; Facio et al., 2007; Reifman et al., 2007). Students in this phase have special characteristics which may not fit with pedagogical and andragogical strategies in the classroom (Hägg & Kurczewska, 2020). Vocational high schools facilitate students to develop their skill, not only their knowledge; this is one of the

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andragogy principles (Blaschke, 2019). The effort to mix andragogy and pedagogy may have benefitted the learning outcomes (Bowling & Henschke, 2020). A mixed approach of andragogy and pedagogy meets the characteristics of students in their emerging adulthood phase (Adebisi & Oyeleke, 2018; Hägg & Kurczewska, 2020).

The interplay between the approaches in teaching-learning process has advanced from pedagogy-andragogy into pedagogy-andragogy-cybergogy. Sophisticated learning technologies have increasingly pushed the use of cybergogy in learning (Iszatt-White et al., 2017). COVID-19 pandemic is also responsible for the movement from pedagogy and andragogy approaches into cybergogy (Stukalo & Simakhova, 2020).

Self-regulated learning is the focus of student-centered learning. Self-regulated learning is the ability of learners to control what they want to learn based on their cognition, emotion, and motivation (Baumeister & Vohs, 2007; Panadero, 2017). The use of technology and cybergogy approach in the learning process may require students' self-regulation of learning (Bizami et al., 2022). Andragogy effect on self-regulated learning has been studied in some research. Implementing andragogy and cybergogy approaches can boost students' self-regulated learning (Guo, 2020; Muresan, 2014; Savickas & Porfeli, 2011; Yang & Wong, 2020). These studies provide conceptual information of how the approaches may affect students' self-regulated learning. There has been no research with empirical data that focuses on pedagogy-andragogy-cybergogy continuum and the interplay on the classroom praxis and their effect on students' self-regulated learning, especially on grade 12 vocational high school students which may be considered as emerging adults. The current research investigated the practices of pedagogy-andragogy-cybergogy continuum in a vocational high school and their effect on promoting students' self-regulated learning.

Literature Review

Pedagogy

Pedagogy is an act of teaching including planning and executing (Alexander, 2004, 2008). Pedagogical approach supports the idea to educate children and youths (Savicevic, 2008). Industrial revolution has influenced the development of pedagogy in a way; combining existing knowledge with the newer one needs to be systematic (Malek, 2017). Pedagogy is a way of teach students about concepts stated in textbooks (Schrum et al., 2007). Pedagogy has some key principles.

Pedagogy has some extensions, but the current research used traditional pedagogy which is still widely use in Indonesia. Traditional pedagogy has been linked with behaviorism which states that students' behavior can be predicted, influenced, and modified through reward and punishment (Bowling & Henschke, 2020). Pedagogy has the following characteristics: (1) teacher dependent and determined, (2) structured method, and (3) depending on exogenous factors (Bowling & Henschke, 2020; Malek, 2017). These characteristics may be operationalized through some indicators. The indicators are presented on table 1.

Andragogy

The definitions of andragogy by experts are generally similar to Knowle's definition of Andragogy (Henschke, 2015). Knowle's definition of Andragogy is just one of several concepts of andragogy (Loeng, 2018). The term of andragogy comes from the Greek of "aner" which means "man" and agein which means "to lead". Andragogy can be defined as a man that leads. Since andragogy is a widely known term, it is defined as adults (of all genders) that lead (Loeng, 2018).

Andragogical institutions were established hundreds of year before children education (Savicevic, 2008). In Europe, there were 5 different views on andragogy: (1) andragogy as pedagogy discipline, (2) andragogy as integrative science, (3) andragogy as both pragmatic and practical, (4) andragogy as a field of research, and (5) andragogy as an independent scientific discipline with its own scientific structure (Savićević, 1991).

As a discipline, andragogy can be regarded as the progression of pedagogy where students have more autonomy and teachers have less instructions (Blaschke, 2019). Andragogy has the principles of (1) dependent and independent, (2) single-loop, (3) teacher-guided with a linear design, (4) self and group learning, and (5) depending on endogenous factors (Malek, 2017; Wozniak, 2020).

Cybergogy

ICT in learning in the 21st century requires redesign or regeneration of the education system, especially vocational education. Teachers and students will benefit from using ICT tools in learning, such as e-learning, mobile learning, and online learning (Basak et al., 2018). This redesign is called cybergogy. Cybergogy is a strategy used by teachers to create engaging learning through online media (Wang & Kang, 2006).

One implementation of the cybergogy approach is providing interactive learning contents to make active learning effective and increase learning effectiveness, transfer knowledge sharing, student confidence, and interest and ultimately foster independent learning (Daud et al., 2019). The cybergogy approach in learning can be used anywhere and anytime by accessing computers and the internet through e-learning, facilitating collaborative learning strategies and discussions (Mustapha et al., 2021).

Self-Regulated Learning

Self-regulated learning (SLR) is a process in which students personally used their cognitions, affects and behaviors to achieve the learning goals (Schunk & Zimmerman, 2011). Bandura (1986) defines SRL as students' situation in learning to actively take part in arranging their activities in studying, promote their motivation and academic purpose, regulate human and learning resources, and execute the decision and its implementation in the process of learning. Zimmerman states that SRL is students' ability to actively engage in the education process using their metacognitive, motivation, and behavior (Cleary & Zimmerman, 2004; Zimmerman, 1989).

Self-Regulated Learning aims to facilitate the creation of effective independent learning for each individual by inspiring oneself in learning. The indicators of Self-Regulated Learning support teachers in creating a student-centered learning framework (Nu'man et al., 2021). Self-regulated learning ensures that students become the main agents in active learning. The curriculum currently applied in Vocational High Schools optimizes learner-centered learning so that students self-regulate and motivate themselves in setting goals and reflecting on learning outcomes by using various learning skills; students apply constructivism learning theory by thinking metacognitively (Pintrich, 2004; Zimmerman, 2011).

SLR has several dimensions, namely goal setting, help seeking, self-learning, managing physical environment, and effort regulation (Kocdar et al., 2018). These SLR dimensions are used in the current research because SLR is developed based on distance learning which might fit with cybergogy on the distance learning in COVID-19 pandemic.

Methodology

Research goal

The main objective of the present study is to investigate the relationship among pedagogy, andragogy, and cybergogy approaches as part of hybrid approach praxis used for Indonesian students. The impact of this relationship on students' self-regulation in learning is also investigated.

Research Type

The research employs quantitative method. The relationship among students' perceptions about pedagogy, andragogy, cybergogy praxis and their self-regulated learning was modeled using structural equation model (SEM). One popular and powerful type of SEM is structural equation model using partial least square method to estimate the model parameter (PLS-SEM) (Akter et al., 2017). PLS-SEM has two separate assessments of the final results. The assessments evaluate the measurement and structural models (Hair et al., 2011). The measurement model is called outer model whereas the structural model can also be defined as inner model.
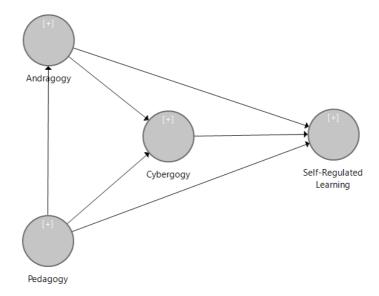

Figure 1. The Framework of Pedagogy-Andragogy Continuum with Cybergogy

The framework above shows that there are mediated paths between the variables. Mediated paths are paths between two variables that are mediated by the third variable (Sarstedt et al., 2020). Mediator variable is a variable that transmits the effect of the independent variable to the dependent variable (Demming et al., 2017; Hair et al., 2021). The framework of the current research shows that andragogy and cybergogy mediate the pedagogy effect on self-regulated learning. Cybergogy also transmits the effect of andragogy to self-regulated learning.

Sample

In the structural equation model, determining the sample size is still an object of discussions. The most popular method is the 10-fold method (J. F. Hair et al., 2011; Kock & Hadaya, 2018). Based on the method, the number of samples should be at least ten times the number of links in the outer and inner model (Goodhue et al., 2012). Since this 10-fold method is shown to give less power, it is not effective (Kock & Hadaya, 2018). The higher power in minimum sample determination is shown by the inverse square root method (Kock & Hadaya, 2018).

Using WARPls and the structural model in the current research, the minimum sample determination with $\alpha = 5\%$ and 85% power ($1 - \beta = 85\%$) using inverse square root method is equal to 432. The number of samples in the current research is 450 students which exceeds the minimum sample size.

Instrument

The instrument was a questionnaire with 5-point likert scale. Questionnaire is the most popular instrument used in research especially in educational research (Radhakrishna, 2007). Using a questionnaire in research may decrease the research cost (Jack & Clarke, 1998) and make the data gathering efficient (Codó, 2008). The instruments used in the current research were developed from the literature review done in the previous part (table 1). From the 4 variables of the model, three of them are newly developed instruments. The only instrument adapted from the existed instrument is the self-regulated learning instrument.

Table 1. Constructs and Their Indicators

Construct	Indicators	Sources
Pedagogy	1. Teacher dependent and determined 2. Structured method 3. Depend on exogenous factors	(Bowling & Henschke, 2020; Malek, 2017)
Andragogy	1. Teacher dependent and independent 2. Single-loop 3. Teacher-guided with linear design 4. Self and group learning	(Malek, 2017; Wozniak, 2020)
Cybergogy	1. Independent 2. Online learning 3. Networking 4. Everywhere-loop learning 5. Reduced teacher guide	(Malek, 2017; Mustapha et al., 2021; Wang & Kang, 2006)
Self-Regulated Learning	1. Goal setting 2. Seeking help 3. Self-learning 4. Physical environment management 5. Regulated effort	(Kocdar et al., 2018)

The development of the instrument was done based on their indicators (table 1). The instrument was given to the participants using a digital form. Since there were two or more variables, variable items in the digital form were separated in different part of the form. This is done to control common method bias (Podsakoff et al., 2003). The validity and reliability of the items developed are discussed in measurement models of structural equational model in findings.

Findings

Measurement Models

In the model of the current research, students' perception on pedagogy approach in the classroom is the exogenous variable. The perceptions on andragogy and cybergogy praxis, and the students' self-regulated learning are the endogenous variables. The model was constructed to investigate the relationship between these variables and their impact on students' self-regulated learning.

The measurement models of variables were established using reflective model. The indicators were acquired from the literature on pedagogy, andragogy, and cybergogy praxis and also students' self-regulated learning. The indicators are reflection of the contracts in the model.

The evaluation of the measurement model is focused on the reliability and validity of the constructs (do Valle & Assaker, 2016). The first measurement to check in the measurement model is the item factor loadings. Factor loadings measure the internal consistency of the items. Factor loadings should be larger than .708 (Hair et al., 2011, 2017). In a newly made instrument, the internal consistency larger than .6 is acceptable (Hulland, 1999). All items in pedagogy, andragogy and

cybergogy meet the internal consistency criteria. Some problematic items in self-regulated learning which have not met the .6 threshold are excluded from the model.

Table 2. Result of measurement model evaluation

Construct/Factors	Item	Outer Loadings	Rho A	Composite Reliability (CR)	Average Variance Extracted (AVE)
Pedagogy	PED1	.7394	.831	.8657	.5207
	PED2	.6888			
	PED3	.7981			
	PED4	.7303			
	PED5	.8043			
	PED6	.7262			
Andragogy	AND1	.6801	.8466	.8843	.561
	AND2	.7673			
	AND3	.7876			
	AND4	.8077			
	AND5	.7748			
	AND6	.7991			
Cybergogy	CYB1	.7566	.8904	.9097	.5908
	CYB2	.6299			
	CYB3	.6461			
	CYB4	.6503			
	CYB5	.8118			
	CYB6	.7957			
	CYB7	.7714			
Self-Regulated Learning	SRL 1	.6451	.842	.8775	.5069
	SRL 2	.7145			
	SRL 3	Out			
	SRL 4	Out			
	SRL 5	Out			
	SRL 6	Out			
	SRL 7	.7439			
	SRL 8	.7835			
	SRL 9	.6984			
	SRL 10	Out			
	SRL 11	.655			
	SRL 12	.7332			

Note. The value of loading items marked "out" are those that are eliminated because they do not meet the criteria >0.6.

Measuring internal reliability consistency through composite reliability, Cronbach alpha, and rho is a way to assess the construct reliability (Cepeda-Carrion et al., 2019; Hair et al., 2020). Cronbach alpha is shown to be less precise than composite reliability (Hair et al., 2019). Compared to the other two measurements, Rho A is a usable reliability measurement, and its value is shown to have more precise results than Cronbach Alpha but less precise result than composite reliability (Dijkstra & Henseler, 2015). A reliable item should have a minimum of .708 of its Rho A and composite reliability (Franke & Sarstedt, 2019; Sarstedt et al., 2022). Items of the constructs have Rho A and composite reliability larger than .708 which makes them reliable.

Another key psychometric in measurement model is average variance extracted (Chin, 2010). AVE measures the convergent validity of the construct in the measurement model (Hair et al., 2019, 2021). AVE of the construct has to be at least .5 (Akter et al., 2017). All constructs in the model meet the AVE criteria. At first running of the model, AVE of Self-Regulated Learning does not exceed the .5 criteria. AVE of Self-Regulated Learning can meet the criteria by excluding the unsatisfactory factor loadings. The construct with items exceeding the rule of thumb of the factor loadings makes AVE of the construct produce satisfactory reliabilities (Bagozzi & Yi, 1988).

Table 3. Descriptive Statistics and Heterotrait-Monotrait Ratio of the Model

	Mean	SD	Pedagogy	Andragogy	Cybergogy
Pedagogy	4.05	1.00			
Andragogy	4.12	0.70	.6198		
Cybergogy	3.87	0.80	.5405	.7374	
Self-Regulated Learning	4.16	0.68	.4865	.7731	.73

The last criteria checked is discriminant validity. Discriminant validity is one of key measurements in model evaluation (Bagozzi & Phillips, 1982). As the most widely used ratio, Heterotrait Monotrait Ratio (HTMT) has the largest sensitivity. HTMT can identify the construct with lack of discriminant validity (Henseler et al., 2015). Since HTMT ratio calculates the average correlation of the items with other constructs, it should be limited with maximum threshold. HTMT ratio must be lower than .85 (Hair et al., 2020). HTMT of the constructs in the model indicates that the constructs have a good discriminant validity (Table 3).

Structural Model

Since the measurement model indicates that the constructs give a valid dan reliable data, the structural model may be discussed. The structural model shows the relationship between latent variables (Hair et al., 2011).
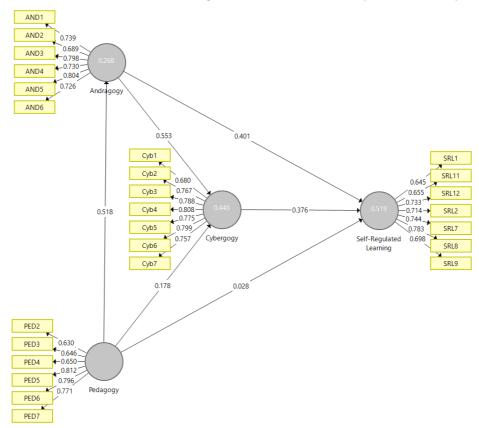

Figure 2. Structural Model of Pedagogy-Andragogy Continuum with Cybergogy

Table 4 shows the relationship between constructs by bootstrapping the data and producing t statistics. Bootstrap result shows that all paths in the structural model have a significant value except the path connecting pedagogy and self-regulated learning. Pedagogy does not directly affect the self-regulated learning, but its indirect paths through andragogy and cybergogy has a significant value.

Table 4. Path Coefficients of the Structural Model

Path	Path Coef.	t Statistics	p Values
Andragogy -> Cybergogy	0.5532	14.7333	.000
Andragogy -> Self-Regulated Learning	0.4009	8.1821	.000
Andragogy -> Self-Regulated Learning*	0.2081	7.5238	.000
Cybergogy -> Self-Regulated Learning	0.3761	8.0848	.000
Pedagogy -> Andragogy	0.5181	13.7892	.000
Pedagogy -> Cybergogy	0.1784	4.2719	.000
Pedagogy -> Cybergogy*	0.2866	10.6216	.000
Pedagogy -> Self-Regulated Learning	0.0278	0.6768	.499
Pedagogy -> Self-Regulated Learning*	0.3826	11.9304	.000
Peeragogy -> SRL	0.2216	3.8499	.000

* Indirect Effect

Since there are direct and indirect effect on some constructs, the appropriate statistics to investigate the effect on each construct in the structural model is its total effect.

H1: Andragogy (AND) has positive significant total effect on Cybergogy

The result of the structural model on total effect indicates that andragogy has positive significant total effect on Cybergogy ($\beta = 0.553, p < .001$). This result indicate that proposed hypothesis is accepted.

H2: Andragogy (AND) has a positive significant effect on Self-Regulated Learning

The structural model shows that the total effect of andragogy on self-regulated learning is positive and significant ($\beta = 0.609, p < .001$). This result indicates that the proposed hypothesis is accepted.

H3: Cybergogy (CYB) has a positive significant effect on Self-Regulated Learning

The result of the structural model on total effect indicates that cybergogy has a positive significant effect on self-regulated learning ($\beta = 0.376, p < .001$). This result indicates that the proposed hypothesis is accepted.

H4: Pedagogy (PED) has a positive significant effect on Andragogy.

The structural model shows that the total effect of pedagogy on andragogy is positive and significant ($\beta = 0.518, p < .001$). This result indicates that the proposed hypothesis is accepted.

H3: Cybergogy (CYB) has a positive significant effect on Self-Regulated Learning

The result of the structural model on total effect indicates that cybergogy has a positive significant effect on self-regulated learning ($\beta = 0.376, p < .001$). Thus, it can be concluded that the proposed hypothesis is accepted.

H4: Pedagogy (PED) has a positive significant effect on Andragogy.

The structural model shows that the total effect of pedagogy on andragogy is positive and significant ($\beta = 0.518, p < .001$). Hence it can be concluded that the proposed hypothesis is accepted.

H5: Pedagogy (PED) has a positive significant effect on Cybergogy

The structural model shows that the total effect of pedagogy on cybergogy is positive and significant ($\beta = 0.465, p < .001$). Hence it can be concluded that the proposed hypothesis is accepted.

H6: Pedagogy (PED) has a positive significant effect on Self-Regulated Learning

The structural model shows that the total effect of pedagogy on self-regulated learning is positive and significant ($\beta = 0.465, p < .001$). Hence, it can be concluded that the proposed hypothesis is accepted. Since the direct path from pedagogy to self-regulated learning is insignificant, the effect of pedagogy on self-regulated learning is fully mediated (Nitzl et al., 2016).

Table 5. Total Effect of the Structural Model

Hypo thesis	Path	Path Coef.	T Statistics	P Values	Decision
H1	Andragogy -> Cybergogy	0.5532	14.7333	.000	Accepted
H2	Andragogy -> Self-Regulated Learning	0.6089	15.4264	.000	Accepted
H3	Cybergogy -> Self-Regulated Learning	0.3761	8.0848	.000	Accepted
H4	Pedagogy -> Andragogy	0.5181	13.7892	.000	Accepted
H5	Pedagogy -> Cybergogy	0.465	12.0735	.000	Accepted
H6	Pedagogy -> Self-Regulated Learning	0.4104	9.7853	.000	Accepted

Discussion

The result of the current research indicates that classroom instructions in COVID-19 pandemic have interplayed pedagogy, andragogy and cybergogy approaches. School closure in COVID-19 pandemic has transformed learning process in classroom into online and distance learning (ODE). ODE may convert the pedagogy approach into androgogy approach because andragogy approach is relevant with ODE context (Blaschke, 2019).

Andragogy praxis is affected by pedagogy approach. Andragogy approach emphasizes the single loop learning in pedagogy and changes the learning process from instructor-directed to instructor-learner directed (Blaschke, 2016, 2019; Kanwar et al., 2013). Due to this change, the pedagogy praxis in the classroom may affect the andragogy praxis, especially in emerging adults.

On interplaying these three approaches, cybergogy praxis is also related to pedagogy and andragogy praxis. There is a relationship between pedagogy, andragogy, and cybergogy. Cybergogy has a central principle from the combination of pedagogy and andragogy to get a novel approach in virtual distance learning environment (Cronin et al., 2009; Scopes, 2009). A good practice of cybergogy includes positioning students as the focus and center of the learning process,

promoting learning environment which engages the students, and giving students a space for reflection (Cronin et al., 2009; Goody & Malone, 1999; Laurillard, 2002; Wang, 2007).

Pedagogy praxis in the classroom indicates an unsignificant effect on self-regulated learning. Pedagogy has characteristics that may contradict self-regulation of students on their learning process. Pedagogy approach in learning is connected to behaviorism (Bowling & Henschke, 2020). Behaviorism in learning process is also called as the stimulus-response theory (Clark, 2018; Mowrer & Klein, 2000). Classroom with stimulus-response theory is dominated by teachers with their stimulus. The classroom is teacher dependent (Kaplan, 2003; Tümen Akyıldız, 2019), which gives a little space to students to regulate their learning.

The other two approaches on the continuum indicate different results. Andragogy praxis in the classroom is proven to promote the self-regulated learning of the students. Andragogy is the progression of pedagogy on the continuum which gives more space for student autonomy (Blaschke & Hase, 2019). Student autonomy allows students to determine what to learn and when they learn (Abeni, 2020; Aziz et al., 2017; Putarek & Pavlin-Bernardić, 2020). The student autonomy is also shown in cybergogy approach (Bizami et al., 2022). Student autonomy has a direct effect on student-self regulated learning. Students with acceptable level of autonomy will regulate their learning by themselves (Oates, 2019). However, cybergogy has least effect on self-regulated learning.

The minimum effect of cybergogy on self-regulated learning can be caused by some factors related to the use of the internet and technology. Indonesian students are not used to using various technologies in the learning process (Hasudungan et al., 2021). There are also some obstacle in using the technology related to the insufficient internet infrastructure to improve the quality of student learning (Sardjuningsih & Huda MF, 2022), such as the connection quality of the internet and the amount of internet quota available to access online learning sources (Qhoimah et al., 2022).

Conclusion

The result has reflected the interplay of pedagogy, andragogy, and cybergogy praxis in the classroom and its effect on promoting student self-regulated learning. The current research shows an empirical relationship of the approaches on pedagogy-andragogy-cybergogy continuum. The result strengthens the conceptual framework of the continuum and demonstrates how it may affect student self-regulated learning. Pedagogy praxis has been proven to have a limited effect on SRL since traditional pedagogy provides less space for student autonomy in the learning process. On the other hand, andragogy and cybergogy approaches give a strong effect on how the students may regulate their learning. The ability of these two approaches to promote self-regulated learning of the students is the autonomy characteristic of the approaches.

The results also reflect that interplaying pedagogy, andragogy and cybergogy in the classroom can improve students' self-regulation in learning process. Pedagogy approaches may have no direct effect on promoting students' self-regulation in learning process, but it provides basic principles for andragogy and cybergogy development.

Recommendations

The present research has proven the relationship of pedagogy-andragogy-cybergogy continuum and its relationship to students' self-regulated learning. The result also supports the pedagogy-andragogy-cybergogy continuum as a conceptual framework. Further research can include other learning approaches that may also have an interplay in the classroom praxis. The classroom praxis may also include heutagogy and peeragogy.

Limitations

The current research has some limitations, especially related to sample and population of the study. The sample of the current research includes vocational high school students from two provinces in Indonesia, South and West Sulawesi. Since andragogy and other innovative pedagogies should be applied in adult learners, the model can also be tested on adult learning in higher education.

Authorship Contribution Statement

Amiruddin: Conceptualization, design, data acquisition, interpretation, and critical revision of the manuscript. Baharuddin: Conceptualization and design. Takbir: Technical and material support. Setialaksana: Statistical Analysis, interpretation, drafting manuscript, and editing. Muhammad Hasim: Technical support, drafting manuscript, and critical revision of manuscript.

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References

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Abeni, E. A. (2020). Andragogy: A theory in practice in higher education. *Journal of Research in Higher Education*, *4*(2), 54–71. https://doi.org/10.24193/JRHE.2020.2.4

Adebisi, T. A., & Oyeleke, O. (2018). Promoting effective teaching and learning in online environment: A blend of pedagogical and andragogical models. *Bulgarian Journal of Science and Education Policy*, *12*(1), 153–172. http://bjsep.org/getfile.php?id=263

Akter, S., Fosso Wamba, S., & Dewan, S. (2017). Why PLS-SEM is suitable for complex modelling? An empirical illustration in big data analytics quality. *Production Planning and Control*, *28*(11–12), 1011–1021. https://doi.org/10.1080/09537287.2016.1267411

Alexander, R. (2004). Still no pedagogy? principle, pragmatism and compliance in primary education. *Cambridge Journal of Education*, *34*(1), 7–33. https://doi.org/10.1080/0305764042000183106

Alexander, R. (2008). *Essays on pedagogy*. Routledge. https://doi.org/10.4324/9780203609309

Arnett, J. J. (2000). Emerging adulthood: A theory of development from the Late teens through the twenties. *American Psychologist*, *55*(5), 469–480. https://doi.org/10.1037/0003-066X.55.5.469

Arnett, J. J. (2007). Emerging adulthood: What is it, and what is it good for? *Child Development Perspectives*, *1*(2), 68–73. https://doi.org/10.1111/j.1750-8606.2007.00016.x

Aziz, F., Qureshi, U., & Khanam, A. (2017). Self-Regulated learning and diversity at higher education level in Pakistan. *Journal of Managerial Sciences*, *11*(3), 407-420. https://bit.ly/42hiwIG

Bagozzi, R. P., & Phillips, L. W. (1982). Representing and testing organizational theories: A holistic construal. *Administrative Science Quarterly*, *27*(3), 459-489. https://doi.org/10.2307/2392322

Bagozzi, R. P., & Yi, Y. (1988). On the evaluation of structural equation models. *Journal of the Academy of Marketing Science*, *16*(1), 74–94. https://doi.org/10.1007/BF02723327

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Prentice Hall, Inc.

Basak, S. K., Wotto, M., & Bélanger, P. (2018). E-learning, M-learning and D-learning: Conceptual definition and comparative analysis. *E-Learning and Digital Media*, *15*(4), 191–216. https://doi.org/10.1177/2042753018785180

Baumeister, R. F., & Vohs, K. D. (2007). Self-Regulation, ego depletion, and motivation. *Social and Personality Psychology Compass*, *1*(1), 115–128. https://doi.org/10.1111/j.1751-9004.2007.00001.x

Bizami, N. A., Tasir, Z., & Na, K. S. (2022). Innovative pedagogical principles and technological tools capabilities for immersive blended learning : A systematic literature review. *Education and Information Technologies, 28,* 1373-1425. https://doi.org/10.1007/s10639-022-11243-w

Blaschke, L. M. (2016). *Strategies for implementing self-determined learning (heutagogy) within education: A comparison of three institutions (Australia, South Africa, and Israel)* [Master's thesis, Carl von Ossietzky Universität Oldenburg]. ResearchGate. https://doi.org/10.13140/RG.2.2.23074.63687

Blaschke, L. M. (2019). The pedagogy–andragogy–heutagogy continuum and technology-supported personal learning environments. In I. Jung (Ed.), *Open and distance education theory revisited: Implications for the digital era* (pp. 75–84). Springer. https://doi.org/10.1007/978-981-13-7740-2_9

Blaschke, L. M., & Hase, S. (2019). Heutagogy and digital media networks. *Pacific Journal of Technology Enhanced Learning*, *1*(1), 1–14. https://doi.org/10.24135/pjtel.v1i1.1

Bowling, J., & Henschke, J. (2020). Pedagogy and andragogy. In *The Handbook of Adult and Continuing Education*. Stylus Publishing LLC.

Cepeda-Carrion, G., Cegarra-Navarro, J. G., & Cillo, V. (2019). Tips to use partial least squares structural equation modelling (PLS-SEM) in knowledge management. *Journal of Knowledge Management*, *23*(1), 67–89. https://doi.org/10.1108/JKM-05-2018-0322

Chin, W. W. (2010). How to write up and report PLS analyses. In V. Esposito Vinzi, W. W. Chin, J. Henseler, & H. Wang (Eds.), *Handbook of partial least squares* (pp. 655–690). Springer. https://doi.org/10.1007/978-3-540-32827-8_29

Clark, K. R. (2018). Learning theories: Behaviorism. *Radiologic Technology, 90*(2), 172-175. https://l24.im/hTwqNgS

Cleary, T. J., & Zimmerman, B. J. (2004). Self-regulation empowerment program: A school-based program to enhance self-regulated and self-motivated cycles of student learning. *Psychology in the Schools*, *41*(5), 537–550. https://doi.org/10.1002/pits.10177

Codó, E. (2008). Interviews and questionnaires. In L. Wei & M. G. Moyer (Eds.), *The Blackwell guide to research methods in bilingualism and multilingualism* (pp. 132-157). Wiley. https://doi.org/10.1002/9781444301120.ch9

Collazos, C. A., Fardoun, H., AlSekait, D., Pereira, C. S., & Moreira, F. (2021). Designing online platforms supporting emotions and awareness. *Electronics*, *10*(3), 251. https://doi.org/10.3390/electronics10030251

Cronin, J. G. R., McMahon, J. P., & Waldron, M. (2009). Critical survey of information technology use in higher education: Blended classrooms. In C. R. Payne (Ed.), *Information Technology and Constructivism in Higher Education* (pp. 203–215). IGI Global. https://doi.org/10.4018/978-1-60566-654-9.ch013

Daud, W. W. A. A. W., Teck, W. K., Ghani, M. T. A., & Ramli, S. (2019). The needs analysis of developing mobile learning application for cybergogical teaching and learning of Arabic language proficiency. *International Journal of Academic Research in Business and Social Sciences*, *9*(8), 33–46. https://doi.org/10.6007/IJARBSS/v9-i8/6206

Deineha, I., Hromozdova, L., & Kovach, V. (2020). Realities of practical andragogy in the condition of the COVID-19 pandemic: Migration pedagogy in Ukraine. *ScienceRise: Pedagogical Education*, *5*(38), 4–10. https://doi.org/10.15587/2519-4984.2020.212892

Demming, C. L., Jahn, S., & Boztuǧ, Y. (2017). Conducting mediation analysis in marketing research. *Marketing: ZFP – Journal of Research and Management*, *39*(3), 76–93. https://doi.org/10.15358/0344-1369-2017-3-76

Diacopoulous, M. M., & Butler, B. M. (2021). Pedagogical and andragogical considerations in online teacher education. *Online Teaching and Learning for Teacher Educators*. https://bit.ly/3prbvTa

Dijkstra, T. K., & Henseler, J. (2015). Consistent partial least squares path modeling. *MIS Quarterly*, *39*(2), 297–316. https://doi.org/10.25300/MISQ/2015/39.2.02

do Valle, P. O., & Assaker, G. (2016). Using partial least squares structural equation modeling in tourism research: A review of past research and recommendations for future applications. *Journal of Travel Research*, *55*(6), 695–708. https://doi.org/10.1177/0047287515569779

Facio, A., Resett, S., Micocci, F., & Mistrorigo, C. (2007). Emerging adulthood in Argentina: An age of diversity and possibilities. *Child Development Perspectives*, *1*(2), 115–118. https://doi.org/10.1111/j.1750-8606.2007.00025.x

Franke, G., & Sarstedt, M. (2019). Heuristics versus statistics in discriminant validity testing: A comparison of four procedures. *Internet Research*, *29*(3), 430–447. https://doi.org/10.1108/IntR-12-2017-0515

Goodhue, D. L., Lewis, W., & Thompson, R. (2012). Does PLS have advantages for small sample size or non-normal data? *MIS Quarterly*, *36*(3), 981-1001. https://doi.org/10.2307/41703490

Goody, A., & Malone, V. (1999). Cybergogy and adult learning: A case research study used as a decision making tool in higher education. In H. E. Klein (Ed.), *Proceedings of the International Conference on Case Method Research & Application* (pp. 131-137). World Association for Case Method Research and Application. https://bit.ly/3DCdtaN

Guo, W. (2020). Grade-Level Differences in Teacher Feedback and Students' Self-Regulated Learning. *Frontiers in Psychology*, *11,* Article 783. https://doi.org/10.3389/fpsyg.2020.00783

Hägg, G., & Kurczewska, A. (2020). Guiding the student entrepreneur – Considering the emergent adult within the pedagogy–andragogy continuum in entrepreneurship education. *Education and Training*, *62*(7–8), 759–777. https://doi.org/10.1108/ET-03-2020-0069

Hair, J. F., Howard, M. C., & Nitzl, C. (2020). Assessing measurement model quality in PLS-SEM using confirmatory composite analysis. *Journal of Business Research*, *109*, 101–110. https://doi.org/10.1016/j.jbusres.2019.11.069

Hair, J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., Danks, N. P., & Ray, S. (2021). *Partial least squares structural equation modeling (PLS-SEM) using R*. Springer. https://doi.org/10.1007/978-3-030-80519-7

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a silver bullet. *Journal of Marketing Theory and Practice*, *19*(2), 139–152. https://doi.org/10.2753/MTP1069-6679190202

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, *31*(1), 2–24. https://doi.org/10.1108/EBR-11-2018-0203

Hair J. F. Jr., Matthews, L. M., Matthews, R. L., & Sarstedt, M. (2017). PLS-SEM or CB-SEM: Updated guidelines on which method to use. *International Journal of Multivariate Data Analysis*, *1*(2), 107-123. https://doi.org/10.1504/ijmda.2017.10008574

Hasudungan, A. N., Ofianto, & Ningsih, T. Z. (2021). Learning loss: A real threat in education for underprivileged students and remote regions during the COVID-19 pandemic. *International Journal of Distance Education and E-Learning*, *7*(1), 12–23. https://doi.org/10.36261/ijdeel.v7i1.2223

Henschke, J. A. (2015). *Focusing on the six major themes in the global perspective of andragogy: A June 2015 update.* IACE Hall of Fame Repository. http://bit.ly/3jteds8

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, *43*(1), 115–135. https://doi.org/10.1007/s11747-014-0403-8

Hulland, J. (1999). Use of partial least squares (PLS) in strategic management research: A review of four recent studies. *Strategic Management Journal*, *20*(2), 195–204. https://doi.org/ctxvmf

Iszatt-White, M., Kempster, S., & Carroll, B. (2017). An educator's perspective on reflexive pedagogy: Identity undoing and issues of power. *Management Learning*, *48*(5), 582–596. https://doi.org/10.1177/1350507617718256

Jack, B., & Clarke, A. M. (1998). The purpose and use of questionnaires in research. *Professional Nurse*, *14*(3), 176–179. https://bit.ly/3RvEcMf

Jeanes, E. (2021). A meeting of mind(sets). Integrating the pedagogy and andragogy of mindsets for leadership development. *Thinking Skills and Creativity, 39,* Article 100758. https://doi.org/10.1016/j.tsc.2020.100758

Jones, C., Penaluna, K., & Penaluna, A. (2019). The promise of andragogy, heutagogy and academagogy to enterprise and entrepreneurship education pedagogy. *Education and Training*, *61*(9), 1170–1186. https://doi.org/10.1108/ET-10-2018-0211

Kanwar, A. S., Balasubramanian, K., & Umar, A. (2013). Lifelong learning in South Africa. *International Journal of Continuing Education and Lifelong Learning*, *5*(2), 17–39. https://l24.im/Tc8Bqr

Kaplan, S. (2003). Is there a gifted-child pedagogy? *Roeper Review*, *25*(4), 165. https://doi.org/10.1080/02783190309554223

Kasozi, J. A. (2009). *The implications for educational practice of pedagogical versus andragogical orientations of teacher educators in Botswana*. [Master's thesis, University of south Africa]. UNISA DSpace@İHÜ. http://hdl.handle.net/10500/3426

Knowles, M. S. (1989). *The making of an adult educator: An autobiographical journey*. Jossey-Bass Inc.. https://bit.ly/3HQIElg

Kocdar, S., Karadeniz, A., Bozkurt, A., & Buyuk, K. (2018). Measuring self-regulation in self-paced open and distance learning environments. *The International Review of Research in Open and Distributed Learning*, *19*(1), 25-43. https://doi.org/10.19173/irrodl.v19i1.3255

Kock, N., & Hadaya, P. (2018). Minimum sample size estimation in PLS-SEM: The inverse square root and gamma-exponential methods. *Information Systems Journal*, *28*(1), 227–261. https://doi.org/10.1111/isj.12131

Laurillard, D. (2002). *Rethinking university teaching: A Conversational Framework for the Effective Use of Learning Technologies*. Routledge. https://doi.org/10.4324/9780203160329

Loeng, S. (2018). Various ways of understanding the concept of andragogy. *Cogent Education*, *5*(1), Article 1496643. https://doi.org/10.1080/2331186X.2018.1496643

Malek, J. A. (2017). The impact of heutagogy education through telecentre in smart village (SV). *E-BANGI Journal of Social Sciences and Humanities*, *12*(2), 112–125. http://bit.ly/3HTzwfJ

Mowrer, R. R., & Klein, S. B. (Eds.). (2000). *Handbook of contemporary learning theories*. Psychology Press. https://doi.org/10.4324/9781410600691

Muresan, M. (2014). Using cybergogy and andragogy paradigms in lifelong learning. *Procedia - Social and Behavioral Sciences*, *116*, 4722–4726. https://doi.org/10.1016/j.sbspro.2014.01.1015

Mustapha, R., Jafar, M. F., Othman, M. M., Jusoh, M. K., & Ibrahim, N. S. (2021). The development of I-Cylearn framework in online digital learning in higher education: The fuzzy delphi method study. *International Journal of Academic Research in Business and Social Sciences*, *11*(4), 412-428. https://doi.org/10.6007/IJARBSS/v11-i4/9681

Neck, H. M., & Corbett, A. C. (2018). The scholarship of teaching and learning entrepreneurship. *Entrepreneurship Education and Pedagogy*, *1*(1), 8–41. https://doi.org/10.1177/2515127417737286

Nitzl, C., Roldan, J. L., & Cepeda, G. (2016). Mediation analysis in partial least squares path modeling: Helping researchers discuss more sophisticated models. *Industrial Management & Data Systems*, *116*(9), 1849–1864. https://doi.org/10.1108/IMDS-07-2015-0302

Nu'man, M., Retnawati, H., Sugiman, S., & Jailani. (2021). Measuring self-regulated learning in the STEM framework: A confirmatory factor analysis. *European Journal of Educational Research*, *10*(4), 2067–2077. https://doi.org/10.12973/eu-jer.10.4.2067

Oates, S. (2019). The importance of autonomous, self-regulated learning in primary initial teacher training. *Frontiers in Education, 4,* Article 102. https://doi.org/10.3389/feduc.2019.00102

Panadero, E. (2017). A review of self-regulated learning: Six models and four directions for research. *Frontiers in Psychology*, 8, Article 422. https://doi.org/10.3389/fpsyg.2017.00422

Pintrich, P. R. (2004). A conceptual framework for assessing motivation and self-regulated learning in college students. *Educational Psychology Review*, *16*, 385–407. https://doi.org/10.1007/s10648-004-0006-x

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common Method Biases in Behavioral Research: A Critical Review of the Literature and Recommended Remedies. *Journal of Applied Psychology*, *88*(5), 879–903. https://doi.org/10.1037/0021-9010.88.5.879

Putarek, V., & Pavlin-Bernardić, N. (2020). The role of self-efficacy for self-regulated learning, achievement goals, and engagement in academic cheating. *European Journal of Psychology of Education*, *35*, 647–671. https://doi.org/10.1007/s10212-019-00443-7

Qhoimah, N., Fitriyana, & Apridayanti, R. (2022). Analysis of Education Infrastructure during the Covid-19 Pandemic in High School Indonesian Islamic University. *Proceeding International Conference on Religion, Science and Education*, *1*, 101–107. http://bit.ly/3l7Sg2E

Radhakrishna, R. B. (2007). Tips fordeveloping and testing questionnaires/instruments. *Journal of Extension*, *45*(1). http://bit.ly/3Ll1Dqw

Reifman, A., Arnett, J. J., & Colwell, M. J. (2007). Emerging adulthood: Theory, assessment and application. *Journal of Youth Development*, *2*(1). https://doi.org/10.5195/jyd.2007.359

Santini-Hernández, G. (2022). Pedagogy and andragogy, a shared approach to education in entrepreneurship for students in higher education. In G. J. Larios-Hernandez, A. Walmsley, & I. Lopez-Castro (Eds.), *Theorising Undergraduate Entrepreneurship Education* (pp. 233–251). Palgrave Macmillan. https://doi.org/10.1007/978-3-030-87865-8_13

Sardjuningsih, S., & Huda MF, M. S. (2022). Structure social problem COVID-19 The practice of online learning in Indonesian higher education. *Fenomena*, *21*(2), 175–186. https://doi.org/10.35719/fenomena.v21i2.121

Sarstedt, M., Hair, J. F., Nitzl, C., Ringle, C. M., & Howard, M. C. (2020). Beyond a tandem analysis of SEM and PROCESS: Use of PLS-SEM for mediation analyses! *International Journal of Market Research*, *62*(3), 288–299. https://doi.org/10.1177/1470785320915686

Sarstedt, M., Hair, J. F., & Ringle, C. M. (2022). "PLS-SEM: Indeed a silver bullet" – retrospective observations and recent advances. *Journal of Marketing Theory and Practice*. Advance online publication. https://doi.org/10.1080/10696679.2022.2056488

Savicevic, D. (2008). Convergence or divergence of ideas on andragogy in different countries. *International Journal of Lifelong Education*, *27*(4), 361–378. https://doi.org/10.1080/02601370802051504

Savićević, D. M. (1991). Modern conceptions of andragogy: A European framework. *Studies in the Education of Adults*, *23*(2), 179–201. https://doi.org/10.1080/02660830.1991.11730556

Savickas, M. L., & Porfeli, E. J. (2011). Revision of the career maturity inventory: The adaptability form. *Journal of Career Assessment*, *19*(4), 355–374. https://doi.org/10.1177/1069072711409342

Schrum, L., Thompson, A., Maddux, C., Sprague, D., Bull, G., & Bell, L. (2007). Research on the effectiveness of technology in schools: The roles of pedagogy and content. *Contemporary Issues in Technology and Teacher Education*, *7*(1), 456–460. http://www.editlib.org/p/26278/

Schunk, D. H., & Zimmerman, B. (2011). *Handbook of self-regulation of learning and performance*. Routledge. https://doi.org/10.4324/9780203839010

Scopes, L. J. M. (2009). *Learning archetypes as tools of cybergogy for a 3D educational landscape: A structure for eteaching in second life* [Master's thesis, University of Southampton]. University of Southampton Institutional Repository. http://eprints.soton.ac.uk/id/eprint/66169

Stukalo, N., & Simakhova, A. (2020). COVID-19 impact on Ukrainian higher education. *Universal Journal of Educational Research*, *8*(8), 3673–3678. https://doi.org/10.13189/ujer.2020.080846

Tümen Akyıldız, S. T. (2019). Do 21st century teachers know about heutagogy or do they Still adhere to traditional pedagogy and andragogy? *International Journal of Progressive Education*, *15*(6), 151–169.

https://doi.org/10.29329/ijpe.2019.215.10

Wang, M. (2007). Designing online courses that effectively engage learners from diverse cultural backgrounds. *British Journal of Educational Technology*, *38*(2), 294–311. https://doi.org/10.1111/j.1467-8535.2006.00626.x

Wang, M., & Kang, M. (2006). Cybergogy for engaged learning: A framework for creating learner engagement through information and communication technology. In D. Hung & M. S. Khine (Eds.), *Engaged learning with emerging technologies* (pp. 225–253). Springer. https://doi.org/10.1007/1-4020-3669-8_11

Wozniak, K. (2020). Personalized learning for adults: An emerging andragogy. In S. Yu, M. Ally, & A. Tsinakos (Eds.), *Emerging technologies and pedagogies in the curriculum* (pp. 185–198). Springer. https://doi.org/10.1007/978-981-15-0618-5_11

Yang, L., & Wong, L. P. W. (2020). Career and life planning education: Extending the self-concept theory and its multidimensional model to assess career-related self-concept of students with diverse abilities. *ECNU Review of Education*, *3*(4), 659–677. https://doi.org/10.1177/2096531120930956

Zimmerman, B. J. (1989). A social cognitive view of self-regulated academic learning. *Journal of Educational Psychology*, *81*(3), 329–339. https://doi.org/10.1037/0022-0663.81.3.329

Zimmerman, B. J. (2011). Motivational sources and outcomes of self-regulated learning and performance. In D. H. Schunk & J. A. Greene (Eds.), *Handbook of self-regulation of learning and performance* (pp. 63–78). Routledge.

Appendix

Constructs	Indicators/items
Pedagogy	Teachers use assessment of learning outcomes based on test results and adhere to a system of rewards and punishments regardless of the learning process. (PED1)
	I gain knowledge, attitudes and skills from the teacher through direct learning, reading test books, conducting experiments in the classroom/lab/workshop, audio-visual media, doing questions, quizzes and tests. (PED2)
	I am required to prioritize and instill discipline in the learning process, assignment and assessment. (PED3)
	I am taught knowledge of facts/problems, then theories that match the facts/problems and procedures to solve a given problem. (PED4)
	I was also taught how to analyze, evaluate and create a problem by providing alternative solutions. (PED5)
	I was taught directly to learn and practice to acquire technical competence (work) and career according to the field of expertise. (PED6)
Andragogy	I develop the competencies (knowledge, attitudes and skills) acquired at school on my own initiative for self-study (AND1)
	I gain a lot of competence by seeking and learning from my own experience by interacting with the learning environment both at school and outside of school (AND2)
	I cultivate self-study awareness (AND3)
	I determine the time, place and try myself to study and do learning tasks (AND4)
	I learn from various learning sources by interacting with the learning environment to provide maturity in knowledge and skills (AND5)
	I identify and take the initiative to study on my own to acquire vocational competence in order to meet the demands of the world of work (AND6)
Cybergogy	I actively access the cyber world such as accessing the internet, google classroom/whatsapp group class, youtube to receive and share learning materials (CYB1)
	I can also acquire hard skills (Knowledge and skills) and soft skills (attitudes and character) competencies through online learning both at school and in industry (CYB2)
	I take the initiative to learn on my own, receive and share learning materials by utilizing the internet (online) system available now such as google classroom/whatsapp group class, youtube etc (CYB3)
	I am actively getting used to learning and getting references online (cyber) both knowledge and skill competencies (CYB4)
	I document learning and related materials obtained offline/online on google drive, email, blog etc (CYB5)
	I access the virtual world (internet/cyber) to get the latest learning materials and support (CYB6)
	I usually use digital technology to learn skills/competencies such as zoom, Vlogs, Video podcasts, Smartphones, Google Drive, websites and other technologies (CYB7)
Self-Regulated Learning	I set my study goal each day (SRL1)
	I learned the way I had previously planned (SRL2)
	I usually contact a friend who I think understands the subject I am studying (SRL3)
	I enjoy discussing lessons with other friends (SRL4)
	When it is difficult to understand the lesson, I always ask my friends until I can understand the lesson (SRL5)
	Drawing diagrams, tables or schematics makes it easier for me to learn (SRL6)
	To be able to understand the subject matter, I read it over and over again (SRL7)
	I review lessons and notes to get the gist of the subject matter (SRL8)
	I study in a place where I focus on studying (SRL9)
	In order to study well, I choose a place where no one bothers me (SRL10)
	I study the subject matter until the end even though the lesson is boring (SRL11)
	I always try hard to understand the subject matter (SRL12)