



Heutogogy Model Development: A Holistic Framework to Prepare Future Self-Determined Learner Educator

Heny Kusdiyanti, Sopingi, Karkono, Indra Febrianto, Robby Wijaya, Nur Indah Agustina

Universitas Negeri Malang

heny.kusdiyanti.fe@um.ac.id, sopingi.fip@um.ac.id,
karkono.fs@um.ac.id, indrafabrianto31@gmail.com,
robbywijaya1206@gmail.com, nurindah97@gmail.com

Abstract. Numeracy literacy is a person's dynamic ability to continuously hone his capabilities according to the needs. Previous study indicate the importance of the teacher's role in improving educators' literacy-numerical abilities, while the literacy-numerical abilities of teachers are still varied and still need to be improved. This study aims to develop heutogogy learning model which determine indigenous resource to improve numeracy literacy for high school educator to prepare their educator against disruptive education. This type of research is development research according in two stages, namely (a) exploratory research to identify educator characteristics and needs, and (b) development research to develop heutogogy model based on educators needs. After implemented, heutogogy model succeeded in increasing educator numeracy literacy in high school as a preparation to create competence educator in disruptive education era. This model has also succeeded in improving the literacy-numerical skills of teachers as primary agents of the information literacy movement in schools. The development of this learning model also success to accelerate the literacy-numeracy maturity of teachers, which in turn can boost educators' literacy-numerical abilities, which are needed by the world of education in the next 10 years.

Keywords: addie, educator, heutogogy, numeracy literacy

1 Introduction

Numeracy literacy is one of the highest contributors to the growth of MSMEs in Indonesia. It was recorded that in 2021, MSMEs contributed more than 62% to Indonesia's GDP [1]. Along with the development of the needs of today's business environment, there are more challenges in learning numeracy literacy to fulfill these needs. Various parties have contributed to increasing the success of numeracy literacy learning [2]–[9] who have conducted various studies to improve the effectiveness of numeracy literacy learning. On the other hand, numeracy literacy cannot be separated from educator behavior according to the characteristics of their age. The suitability of behavioral characteristics has been shown to have a positive impact on the success of numeracy literacy

© The Author(s) 2023

M. Salimi et al. (eds.), *Proceedings of the 6th International Conference on Learning Innovation and Quality Education (ICLIQE 2022)*, Advances in Social Science, Education and Humanities Research 767, https://doi.org/10.2991/978-2-38476-114-2_87

learning [10]–[12]. This is something that has been overlooked in numeracy literacy learning in schools. Numeracy literacy learning currently only focuses on the material taught according to the handbook. This is what makes educator interest in numeracy literacy learning is low [13], [14]. The low interest of educators in numeracy literacy learning affects the failure of learning in transferring knowledge in it [15].

Various efforts have been made by previous researchers to meet the needs of today's numeracy literacy learning, such as research from [16] which tries to develop a start-up-based numeracy literacy learning model that can encourage educators with current ideas in the future. However, in this learning model, there is no teacher involvement, even though the teacher's role is still very important in being a facilitator in numeracy literacy learning. The low involvement of teachers affected educators' misconceptions about numeracy literacy material. This misconception was refined by [15] who developed a module with a product-based learning approach that has increased teacher involvement to become educator facilitators during learning. However, the approach developed was not relevant to the current character of educators and was not interactive to meet the needs of educators who have a high curiosity. This is the main reason that every model developed must be following the shifting characteristics of current educators.

Numeracy literacy learning can be carried out optimally if educators have an interest in the material being taught. There is some empirical evidence from previous research that explains the positive relationship of character and educator behavior on numeracy literacy learning interest [17]–[20]. Furthermore, previous research has proven that behavior-based learning has a positive impact on building educator interest in numeracy literacy learning [21]–[23]. This is following the ultimate goal of numeracy literacy, which is to grow educators' intentions to have high numeracy literacy skill. Based on this study, this article will explore the characteristics of educators in numeracy literacy learning that refers to the Theory of Planned Behavior (TPB), which will then be used as a basis for formulating an numeracy literacy learning model to increase self-determined of learner educator

2 Literature Review

2.1 Literacy and Numerical Ability of Teachers

The concept of literacy *skills* and numeracy *skills* (*literacy skills*) are understood in various ways. There are those who understand *literacy skills* as a person's dynamic ability to read, interpret and analyze information and knowledge obtained to improve capabilities in life (Perry, 2012). There are also those who interpret literacy skills as the ability to identify, understand, interpret, and create various information obtained from various sources (written and unwritten) and use it to solve problems encountered (Bruce, 2002). *Literacy skills* can be obtained through a continuous learning process, and with literacy skills a person can achieve the desired goals, develop his knowledge and potential and be able to participate fully in life (Boudard & Jones, 2003).

Numeracy skills are also understood in various ways. In short, numeracy skills can be understood as a person's ability to use mathematics to solve problems, to meet the

needs of life (Chiswick et al., 2003) . Numerical abilities include abilities ranging from basic arithmetic and logical reasoning to advanced mathematical abilities and communication skills. interpretive (Sticht, 2001)

2.2 Learning Adults and Heutogy

One of the learning theories that is more relevant to adult learning in today's era and can be used to reveal the literacy-numerical skills of teachers is the Connectivism Learning Theory (Siemens, 2005) . This theory was born against the background of the fact that the development of life in a knowledge-based society is always connected with the existing knowledge . Learning is a way of being (a way of being) (Vaill & Byrnes, 1998) , done by constantly following and finding out new situations, information or events (Herlo, 2017) , to improve performance (performance) (Driscoll, 2012) , so that a person can live in harmony with the times. This learning understanding is the embodiment of literacy-numerical abilities.

In the conception of the theory of connectivism, there are two important modalities that become the spirit of the learning process, namely (a) learning on one's own ability and awareness, and (b) resilience in learning. In "learning on their own", gave birth to two key concepts, namely self-directed learning and indigenous resources. Self - directed learning is understood that every adult is believed to have the initiative to carry out learning activities, either with or without the help of other parties. This concept is at the core of the andragogy approach. The learning activity starts from the process of diagnosing learning needs, determining learning objectives, identifying learning resources and materials, selecting and implementing learning strategies, to evaluating learning outcomes.

Indigenous resources are understood as a very pro - active learning process where adults act as determinants and even owners of all their affairs and learning needs. This concept is at the core of the heutagogical approach and is an extension of the andragogic approach. Heutogy comes from the Latin self . Hase and Kenyon (2000) define it as the study of indigenous resources (study of learning as a process that is determined by one's own self). Adults who learn determine what will be learned and how it will be learned. Tutors carry out the learning facilitation process by providing guidance and providing the learning resources needed, but still trying optimally so that the determination of learning processes and strategies is entirely on the part of the educators (Blaschke, 2012a).

3 Method

This study uses the ADDIE method which refers to [33] to answer the two focuses of this study, namely exploring the characteristics of educators in numeracy literacy learning that refers to the Theory of Planned Behavior (TPB), which will then be used as a basis in formulating an numeracy literacy learning model for increasing educator interest in numeracy literacy learning. The stages carried out in this research include; 1) Analysis, which was conducted by conducting in-depth interviews with high school

educators as research subjects and collaborating with observations to obtain primary data about the characteristics of educators in numeracy literacy learning which refers to the Theory of Planned Behavior (TPB). Interview and observation respondents consisted of 10 high school educators who were taking numeracy literacy lessons. To test the validity of the data obtained, the researcher used the source triangulation method with 2 supporting respondents and the triangulation method by matching interview transcripts and the results of field observations. The data obtained were analyzed using an interaction model that refers to [34] to determine the characteristics of educators in learning numeracy literacy .

The results of the analysis are used as the basis for formulating the numeracy literacy learning model which is carried out in stage 2) Design, which is carried out by planning an numeracy literacy learning model in the form of Monopoly Gamification. In this process, it was carried out systematically starting from setting learning objectives, designing teaching scenarios and learning activities, designing learning tools, designing learning materials, and evaluating learning outcomes. The design of this Monopoly Gamification model was still conceptual and will underlie the next development process. In stage 3) Development, which realizes the conceptual framework from the previous stage into a product that was ready to be implemented. Furthermore, trials were conducted on material experts and models referring to the inter-rater-agreement [35] with the following formula:

		Expert Opinion 1	
		Low relevance <i>(item rated 1-2)</i>	High relevance <i>(item rated 3-4)</i>
Expert Opinion 2	Low relevance <i>(item rated 1-2)</i>	1. A	2. B
	High relevance <i>(item rated 3-4)</i>	3. C	4. D

The basis for making decisions using the expert test index based on the inter-rater-agreement model [35] is as follows;

$\text{Expert test index} = \frac{D}{A + B + C + D}$
--

- Information:
- A: low relevance of expert 1 and expert 2
 - B: low relevance of expert 1 and high relevance of expert 2
 - C: low relevance of expert 1 and high relevance of expert 2
 - D: high relevance of expert 1 and expert 2

The subject of material expert testing was carried out by; 1) M. Nuruddin Zangky, S.Pd., M.Pd as a lecturer in the management department who focuses on numeracy literacy learning, and M. Asbihani, S.Pd as an Numeracy literacy teacher at Al-Rifaie Modern High School. In the learning model expert testing was carried out by; 1) Dr.

Chau Kien Tsong as an expert on learning models at the University Sains Malaysia, and 2) Dr. Karkono, S.S., M.A as an expert on learning models.

In stage 4) Implementation, was carried out by implementing the Monopoly Gamification model which was developed in small groups to measure the success of the numeracy literacy learning model which was realized in the form of the Monopoly Gamification model in increasing educator interest in numeracy literacy learning. This implementation was carried out on 20 educators of various senior high school in East Java Province. The last stage is 5) Evaluation, which was carried out at each stage of the previous ADDIE method.

4 Result And Discussion

4.1 Exploration of Educator Characteristics in Numeracy Literacy Learning

The results of the exploration of educator characteristics in numeracy literacy learning in this study have been successfully summarized in three main elements in the Theory of Planned Behavior (TPB), namely 1) attitudes towards behavior, 2) subjective norms, and 3) behavioral control. The results of the analysis was illustrated in the following table;

Table 1. Results of Exploration of Educator Characteristics in Numeracy Literacy Learning refers to TPB

No	TPB Element	Educator Characteristic
1	Attitude Towards Behavior	<ol style="list-style-type: none"> 1. Educator didn't know the idea opportunities they can do in the future 2. Educator feel that there were no opportunities for them to have numeracy literacy 3. Educator didn't know how to start the study of numeracy literacy 4. Educator feel numeracy literacy learning was a boring and unimportant lesson
2	Subjective Norms	<ol style="list-style-type: none"> 1. Educator didn't have the support to do learn numeracy literacy 2. Educator got influenced by peers who say that numeracy literacy learning is not interesting 3. Educator has difficult way to understand the numeracy literacy skill
3	Behavioral Control	<ol style="list-style-type: none"> 1. Educator followed peers who didn't pay attention when learning numeracy literacy 2. Educator had irrational thinking that was influenced by the social environment 3. Educator had a low interest in numeracy literacy learning

Source: processed by researchers, 2022

Based on table 1 shows that the attitude towards behavior had a bad attitude in supporting the growth of educator interest in numeracy literacy learning. This negative attitude was the main cause of the failure learning of numeracy literacy. This was in line with several previous studies which state that educator' learning interest will appear when they have a good attitude or perception on the subject [17]–[20]. This cognitive aspect has a domino effect on numeracy literacy learning where a poor attitude will make educator have low self-regulation and do not have assertive behavior in accepting invitations to their social environment.

In the affective aspect, field facts show that subjective norms were still not well internalized. Subjective normals owned by educator tend to lead to deviant behavior which results in the inability of numeracy literacy learning to provide a stimulus to increase educator interest in numeracy literacy learning. The failure of this stimulus reduces educator interest so that numeracy literacy subjects are considered unimportant and useless for their next life.

The condition of the cognitive aspects and affective aspects of educator makes them easily influenced by external stimulus so that they still give negative responses to the stimulus (not listening to learning seriously). There are even educator who claim to have left the class many times in numeracy literacy subjects. The consequences that educator receive for their behavior were 1) not understanding the numeracy literacy material being taught; 2) increasingly assume that numeracy literacy lessons were not interesting because they didn't follow the entrepreneurial simulations carried out in class; 3) got a warning from the teacher and got a bad grade; 4) did not pass the numeracy literacy subject exam.

Based on the explanation of the educator characteristics analysis that refers to the Theory of Planned Behavior (TPB) above, it shows that the stimulus that comes from external factors will be difficult to intervene because it was an uncontrolled factor. The most possible intervention to do is restructure the cognitive and affective aspects on the internal side of educators taking numeracy literacy learning. The appropriate form of intervention to restructure cognitive and affective aspects which will further increase educators' interest in numeracy literacy learning is the gamification learning model that leads to educators' cognitive, affective to psychomotor aspects. The existence of a business implementation simulation from planning, implementation to an evaluation in collaboration with the use of Edukit can be used to touch core beliefs so that it can help educators increase interest in learning numeracy literacy more deeply.

4.2 Heutogogy Model Development

People who learn in addition to considering their own problem-solving process which systemically consists of components of problems, actions, and results, also review the beliefs or points of view that underlie the problem-solving actions they have done. Visually, the process is described as follows.

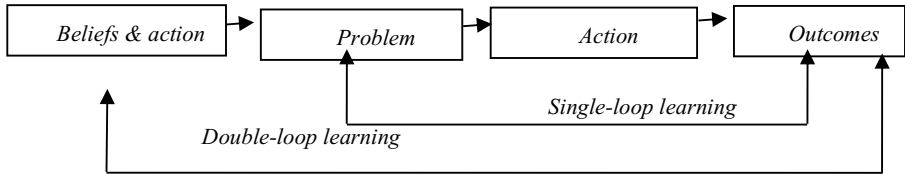


Fig. 1. Problem-solving process schematic

From the figure 1, it can be seen that if someone is still doing the problem solving process, then the person concerned is still doing single-loop. However, if someone has questioned his own beliefs, assumptions or point of view regarding the problem solving process he has done, how the process affects his beliefs, assumptions or point of view, then the person concerned has done a double loop.

Furthermore, *self-reflection* or self-reflection is the ability to reflect on what has been done. In this case a person asks himself whether what has been done has been in accordance with what it should be, why it is not appropriate, what valuable lessons can be taken, and so on, then use these lessons and experiences to improve the steps of his life further. By implementing this ability, adult life continues to experience significant progress.

Indigenous resources oriented to help someone to acquire competence and problem-solving capabilities heutagogically. Competence is characterized by the ability to find the knowledge or skills needed for problem solving, while capability is characterized by self-confidence in their competence in carrying out problem solving actions appropriately and effectively in both familiar and unknown situations. These capabilities include: self-efficacy, communication and teamwork skills, creativity and positive values. Capabilities are the development of competence.

Double loop learning process for person is expected to be more aware of his preferred learning style and better able to adapt his learning style to new situations. Therefore, a person's learning style also contributes to learning. With regard to the implementation of learning, in andragogy, the curriculum, questions, discussions and assessments are designed by the instructor according to the learning needs of the learner. In heutagogy, the learner organizes the required learning materials, designs and develops learning maps. In relation to the level of learning autonomy in heutagogy, andragogy, and pedagogy, it can be described as follows.

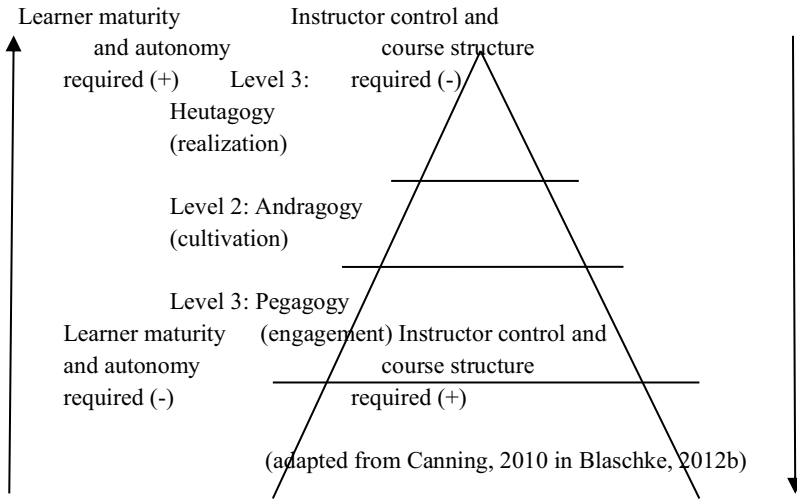


Fig. 2. Relation of the level of learning autonomy in heutagogy, andragogy, and pedagogy

Heutagogy in figure 2 is actually also seen as the ability of adults to carry out the process of solving a problem and at the same time reflecting on their beliefs or points of view related to their experiences in the problem-solving process. Numeracy literacy is usually understood as a deliberate, planned behavior. Numeracy literacy not only react to an external stimulus or catalyze their experience, but also follow a deliberately planned process when starting a experience [36]. Theory of Planned Behavior (TPB) is one of the most frequently used and consistently modeled numeracy literacy intentions in various lines including educator [21], [36]–[39]. In TPB, the intention to perform a behavior stems from the desire to do it and the perception of success in performing the behavior. More specifically, the emergence of intentions is determined by attitudes towards behavior, subjective norms, and perceived behavioral control where the three variables are based on individual beliefs about the benefits that will come from these behaviors [23], [40].

The first element is an attitude towards behavior which describes the desired behavior from the individual's point of view. It describes the personally perceived attractiveness of the target behavior, in this case, being a sustainable educators [23], [40], [41]. Attitudes toward behavior result from behavioral beliefs, which describe the perceived likelihood of positive or negative outcomes of behavior [40], [42]. The second element, subjective norms, concerns how the social environment (such as friends, family, or mentors) approve of certain behaviors. Subjective norms result from normative beliefs that reflect a willingness to comply with the opinions of one's close friends [20], [23], [37], [40]. It describes how the constraints and possibilities of the social environment will affect a person's intention to become an educator [3]. The third element, feasibility is conceptualized using perceptions of behavioral control. This can be compared to self-efficacy and reflects the extent to which an individual believes that he or she is capable

of performing a particular behavior [23], [37], [40], [41]. Perceived behavior as a result of control describes a combination of belief in one's skills and potential facilitators and obstacles experienced. All of these elements come from individual background factors that are difficult to change. For this reason, in learning numeracy literacy, it is necessary to adjust the factors that exist in each individual. The suitability of numeracy literacy learning following these three elements has great potential to increase educator interest in numeracy literacy learning.

Based on the overall assessment of the material expert and user tests on the aspects of usability, convenience of syntax, accuracy, and attractiveness, the results showed that 1) the acceptance index of the 1st and 2nd learning model experts was 0.83; 2) the acceptance index of the 1st and 2nd entrepreneurship material experts was 1. From these results, it can be concluded that the entrepreneurship learning model developed was very appropriate, very useful, very interesting, and very easy to use in increasing educator skill in numeracy literacy. The validated learning model was then implemented in a limited group of 20 educator in east java high school which can be seen below:

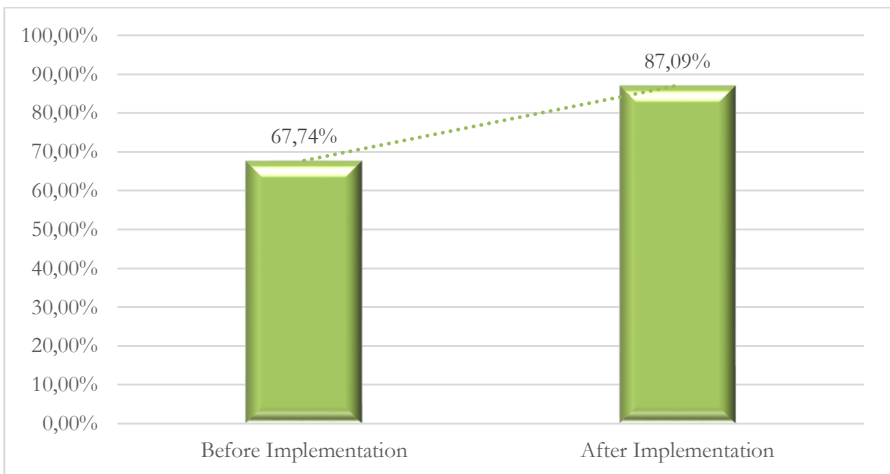


Fig. 3. Educator Numeracy Literacy Skill

The success of numeracy literacy learning is expected by various groups, especially practitioners of educator. Creativity and innovation possessed by high school educators can collaborated which will produce innovative idea and increase the productivity of student itself [43]. The implementation of numeracy literacy learning model can be done flexibly which is in line with the 4.0 industrial revolution that has occurred in Indonesia where technology has become the basis in everyday human life [44], [45]. In line with this development, numeracy literacy learning needs to be carried out more effectively and efficiently. The use of technology and conformity to student characteristics was important for teachers to do in this learning. There are various kinds of models that teachers can use in the learning process such as heutogy models [46], [47].

5 Conclusion

Based on the results of the discussion above, it can be concluded that the results of the educator characteristics analysis in numeracy literacy learning which refers to the Theory of Planned Behavior (TPB) indicate that in three elements, namely attitudes towards behavior, subjective norms, behavioral control possessed by educator tends to lead to a deviant behavior that results in the inability of numeracy literacy learning to provide a stimulus to increase educator skill in numeracy literacy. This was because the cognitive and affective aspects of educator have not been well constructed so they were easily influenced by irrational thoughts from their social environment. This shows that educator need a learning model that was following these characteristics so that they can construct cognitive and affective aspects and create positive stimulus during improving numeracy literacy.

From the results of the analysis, an numeracy literacy learning model was formulated using the integrated heutogogy based on indogenous resource which include three level are realiation, cultivation, engagement wherein each of these level there was several activities carried out by educator to construct cognitive, affective, and psychomotor aspects that will increase numeracy literacy skill of educator. This learning model has been validated by material and learning model experts with that the model was very appropriate, very useful, very interesting, and very easy to use. The results of the limited group trial showed that the learning model succeeded in increasing educator skill in numeracy literacy with a percentage increase of 19.36%.

This research is limited to a trial at 20 educator in East Java Hight School, so further research is needed to measure the success of the learning model developed more comprehensively. Theoretically, the exploration of educator characteristics in numeracy literacy learning is only limited to the theory of planned behavior where there is still the possibility to do a deeper exploration that refers to different theories.

Acknowledgments

This research was supported by Institute for Research and Community Service (LP2M) Universitas Negeri Malang. The authors are responsible for any unintended errors.

References

1. Kemenkopukm, "Kemenkopukm Susun 6 Indikator Strategis Adaptasi Dan Transformasi Kumkm,." 2021. <https://kemenkopukm.go.id/read/kemenkopukm-susun-6-indikator-strategis-adaptasi-dan-transformasi-kumkm>.
2. D. M. Escandón-Barbosa, D. Urbano, A. Hurtado-Ayala, J. Salas paramo, and A. Z. Dominguez, "Formal institutions, informal institutions and entrepreneurial activity: A

- comparative relationship between rural and urban areas in Colombia,” *J. Urban Manag.*, vol. 8, no. 3, pp. 458–471, 2019, doi: 10.1016/j.jum.2019.06.002.
3. A. M. Vuorio, K. Puumalainen, and K. Fellnhofer, “Drivers of entrepreneurial intentions in sustainable entrepreneurship,” *Int. J. Entrep. Behav. Res.*, vol. 24, no. 2, pp. 359–381, 2018, doi: 10.1108/IJEBR-03-2016-0097.
 4. K. Fellnhofer, “Game-based Entrepreneurship Education : Impact on Attitudes , Behaviours and Intentions,” vol. 3, no. July, 2018, doi: 10.1504/WREMSD.2018.089066.
 5. B. R. Hernández-Sánchez, J. C. Sánchez-García, and A. W. Mayens, “Impact of Entrepreneurial Education Programs on Total Entrepreneurial Activity: The Case of Spain,” *Adm. Sci.*, vol. 9, no. 1, p. 25, 2019, doi: 10.3390/admsci9010025.
 6. S. Mkwanzai and C. Mbohwa, “Implications of the 4 th Industrial Revolution on Entrepreneurship Education,” 2018.
 7. T. Nurseto, “PENDIDIKAN BERBASIS ENTREPRENEUR,” *J. Pendidik. Akunt. Indones.*, vol. 1, no. 4, p. 53, 2010, [Online]. Available: file:///C:/Users/WINDOWS 8.1/Downloads/954-2987-1-PB.pdf.
 8. A. Omri and S. Dhahri, “Entrepreneurship Contribution to the Three Pillars of Sustainable Development: What Does the Evidence Really Say?,” 2018.
 9. S. Ramoglou and E. W. K. Tsang, “A REALIST PERSPECTIVE OF ENTREPRENEURSHIP: OPPORTUNITIES AS PROPENSITIES,” *Q Acad. Manag. Rev.*, vol. 41, no. 3, pp. 410–434, 2016, doi: 10.5465/amr.2014.0281.
 10. C. Chien-Chi, B. Sun, H. Yang, M. Zheng, and B. Li, “Emotional Competence, Entrepreneurial Self-Efficacy, and Entrepreneurial Intention: A Study Based on China College Students’ Social Entrepreneurship Project,” *Front. Psychol.*, vol. 11, 2020, doi: 10.3389/fpsyg.2020.547627.
 11. V. Fernández-Pérez, A. Montes-Merino, L. Rodríguez-Ariza, and P. E. A. Galicia, “Emotional competencies and cognitive antecedents in shaping student’s entrepreneurial intention: the moderating role of entrepreneurship education,” *Int. Entrep. Manag. J.*, vol. 15, no. 1, pp. 281–305, 2019, doi: 10.1007/s11365-017-0438-7.
 12. [12] D. M. Suwardi, A. Machmud, and E. Supardi, “Opportunity Recognition and Green Entrepreneurial Intention : The Moderating Effect of Entrepreneurship Education,” vol. 7, no. 1, pp. 42–55, 2021.
 13. E. P. Agbai, “ScholarWorks Pathways to Entrepreneurship Training Towards Addressing Youth Unemployment in Nigeria,” 2018. Accessed: Jan. 15, 2020. [Online]. Available: <https://scholarworks.waldenu.edu/dissertations>.
 14. Genefri, I. Kusumaningrum, M. S. Dewy, and S. Anori, “Learning Outcomes in Vocational Study : A Development of Product Based Learning Model,” *Medwell J.*, vol. 12, no. 5, pp. 831–838, 2017, doi: 10.3923/sscience.2017.831.838.
 15. A. Yulastri, H. Hidayat, S. Islami, and F. Edya, “Developing an Entrepreneurship Module by Using Product-Based Learning Approach in Vocational Education,” *Int. J. Environ. Sci. Educ.*, vol. 12, no. 5, pp. 1097–1109, 2017.
 16. F. Cosenz and G. Noto, “Turning a business idea into a real business through an entrepreneurial learning approach based on dynamic start-up business model simulators,” 2017. Accessed: Jan. 22, 2020. [Online]. Available: <https://www.researchgate.net/publication/317037752>.
 17. A. Fayolle and B. Gailly, “The impact of entrepreneurship education on entrepreneurial attitudes and intention: Hysteresis and persistence,” *J. Small Bus. Manag.*, vol. 53, no. 1, pp. 75–93, 2015, doi: 10.1111/jsbm.12065.

18. M. LORZ, S. MUELLER, and T. VOLERY, "Entrepreneurship Education: a Systematic Review of the Methods in Impact Studies," *J. Enterprising Cult.*, vol. 21, no. 02, pp. 123–151, 2013, doi: 10.1142/s0218495813500064.
19. D. H. B. Welsh, W. L. Tullar, and H. Nemati, "Entrepreneurship education: Process, method, or both?," *J. Innov. Knowl.*, vol. 1, no. 3, pp. 125–132, 2016, doi: 10.1016/j.jik.2016.01.005.
20. F. Zhang, L. Wei, H. Sun, and L. C. Tung, "How entrepreneurial learning impacts one's intention towards entrepreneurship: A planned behavior approach," *Chinese Manag. Stud.*, vol. 13, no. 1, pp. 146–170, 2019, doi: 10.1108/CMS-06-2018-0556.
21. C. Gieure, M. del M. Benavides-Espinosa, and S. Roig-Dobón, "Entrepreneurial intentions in an international university environment," *Int. J. Entrep. Behav. Res.*, vol. 25, no. 8, pp. 1605–1620, 2019, doi: 10.1108/IJEBr-12-2018-0810.
22. S. Martínez-Gregorio, L. Badenes-Ribera, and A. Oliver, "Effect of entrepreneurship education on entrepreneurship intention and related outcomes in educational contexts: a meta-analysis," *Int. J. Manag. Educ.*, vol. 19, no. 3, p. 100545, 2021, doi: 10.1016/j.ijme.2021.100545.
23. H. N. Thelken and G. de Jong, "The impact of values and future orientation on intention formation within sustainable entrepreneurship," *J. Clean. Prod.*, vol. 266, p. 122052, 2020, doi: 10.1016/j.jclepro.2020.122052.
24. K. H. Perry, "What is literacy? -- A critical overview of sociocultural perspectives.," *J. Lang. Lit. Educ.*, vol. 8, no. 1, pp. 50–71, 2012, doi: 10.1017/CBO9781107415324.004.
25. C. S. Bruce, "Information Literacy as a Catalyst for Educational Change. A Background Paper," in *The 3rd International Lifelong Learning Conference*, 2002, no. January 2002, pp. 8–19.
26. E. Boudard and S. Jones, "The IALS approach to defining and measuring literacy skills," *Int. J. Educ. Res.*, vol. 39, no. 3, pp. 191–204, 2003, doi: 10.1016/j.ijer.2004.04.003.
27. B. R. Chiswick, Y. L. Lee, and P. W. Miller, "Schooling, literacy, numeracy and labour market success," *Econ. Rec.*, vol. 79, no. 245, pp. 165–181, 2003, doi: 10.1111/1475-4932.t01-1-00096.
28. [28] T. G. Sticht, "The international literacy survey: How well does it represent the literacy abilities of adults?," *Can. J. Study Adult Educ.*, vol. 15, no. 2, pp. 1–13, 2001.
29. G. Siemens, "Connectivism : a new learning theory?," *J. Instr. Technol. Distance Learn.*, vol. 2, no. 1, pp. 1–5, 2005.
30. C. Vaill, P. B., & Byrnes, "Learning as a way of being. Performan Improvement," *Perform. Improv.*, vol. 37, no. 4, pp. 38–40, 1998.
31. D. Herlo, "Connectivism, A New Learning Theory?," no. May 2017, pp. 330–337, 2017, doi: 10.15405/epsbs.2017.05.02.41.
32. M. P. Driscoll, "Psychological foundations of instructional design," *Trends issues Instr. Des. Technol.*, vol. 18, no. 1978, pp. 35–44, 2012.
33. R. M. Branch, *Instructional Design: The ADDIE Approach*. New York: Springer, 2010.
34. M. B. Miles and M. A. Huberman, "Matthew B. Miles, Michael Huberman - Qualitative Data Analysis_ An expanded Sourcebook 2nd Edition (1994).pdf," p. 338, 1994.
35. R. J. Gregory, *Psychological testing: History, principles, and applications Boston, MA: Pearson*. 2014.
36. N. F. Krueger, M. D. Reilly, and A. L. Carsrud, "Competing models of entrepreneurial intentions," *J. Bus. Ventur.*, vol. 15, no. 5, pp. 411–432, 2000, doi: 10.1016/S0883-9026(98)00033-0.
37. G. Haddad, G. Haddad, and G. Nagpal, "Can students' perception of the diverse learning environment affect their intentions toward entrepreneurship?," *J. Innov. Knowl.*, vol. 6, no. 3, pp. 167–176, 2021, doi: 10.1016/j.jik.2021.04.002.

38. [38] F. Linan and Y.-W. Chen, "Development and Cross-Cultural Application of a Specific Instrument to Measure Entrepreneurial Intentions," *J. Entrep. Theory Pract.*, no. 56, pp. 593–617, 2009.
39. [39] J. A. Moriano, M. Gorgievski, M. Laguna, U. Stephan, and K. Zarafshani, "A Cross-Cultural Approach to Understanding Entrepreneurial Intention," *J. Career Dev.*, vol. 39, no. 2, pp. 162–185, 2012, doi: 10.1177/0894845310384481.
40. [40] I. Ajzen, "The Theory of Planned Behavior," *Organ. Behav. Hum. Decesion Process*, pp. 179–211, 1991, doi: 10.1080/10410236.2018.1493416.
41. [41] E. Autio, R. H. Keeley, M. Klofsten, G. G. C. Parker, and M. Hay, "Entrepreneurial Intent among Students in Scandinavia and in the USA," *Enterp. Innov. Manag. Stud.*, vol. 2, no. 2, pp. 145–160, 2001, doi: 10.1080/14632440110094632.
42. [42] Y. I. A. Khair, Ummul., "Intensi Perilaku Tawuran Ditinjau Dari Theory Of Planned Behavior," *J. Ris. Psikol.*, pp. 1–12, 2019.
43. [43] D. J. Teece, "Business Models, Business Strategy and Innovation," *Long Range Plann.*, vol. 43, 2010, doi: 10.1016/j.lrp.2009.07.003.
44. [44] T. Huseno, "Strategi Perguruan Tinggi dalam Upaya Meningkatkan Kualitas Sumberdaya Manusia," *Maj. Ilm. Lontar*, vol. 24, no. 2, pp. 27–36, 2018.
45. [45] K. Schwab, "The Fourth Industrial Revolution," 2016. [Online]. Available: <http://www.weforum.org>.
46. [46] J. Hamari, D. J. Shernoff, E. Rowe, B. Coller, J. Asbell-Clarke, and T. Edwards, "Challenging games help students learn: An empirical study on engagement, flow and immersion in game-based learning," *Comput. Human Behav.*, vol. 54, pp. 170–179, 2016, doi: 10.1016/j.chb.2015.07.045.
47. [47] L. W. Mina, "Analyzing and Theorizing Writing Teachers' Approaches to Using New Media Technologies," *Comput. Compos.*, vol. 52, pp. 1–16, 2019, doi: 10.1016/j.compcom.2019.01.002.
- 48.

Open Access This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

