



Development of Group Investigation with Data Research-Based Learning Model

Dea Izza Pantari; Siswandari; Khresna Bayu Sangka

Economic Education Master Program, Sebelas Maret University of Surakarta, Indonesia

<http://dx.doi.org/10.18415/ijmmu.v9i1.3416>

Abstract

Alternative learning to overcome problems and limitations during the COVID-19 pandemic can be solved by developing a learning model that can accommodate online digital data research activities. Research activities on the latest data make it easier for lecturers and students to maintain the latest knowledge. The development of the group investigation with data research-based learning model has been validated by learning experts. The result was in good category reviewed by the feasibility of supporting theories, syntax, social systems, principles of reaction, support systems, learning impacts, accompaniment impact, and learning implementation. In addition, the group investigation with data research-based learning model has been tested for its practicality at the limited trial stage.

Keywords: *Group Investigation; Research-Based Learning; Teaching with Data*

Introduction

Every educational institution faces a period of transition and paradigm changes starting the curriculum, teaching materials, and learning evaluation activities, especially after the covid-19 virus was declared as a global pandemic (Aguilera-Hermida, 2020; Ali, 2020; Ivari et al., 2020; Saravanan, 2020). Digital skills and 21st century digital skills are the primary needs of students to achieve global competitiveness through active learning, critical reflection, and problem-solving oriented (Afdal & Spernes, 2018; van Laar et al., 2017). Orientation of producing labor makes the current education system not fast enough to answer in futures workforce that match the needs of contemporary changes (e.g. Industrial Revolution 4.0) (Alam et al., 2020; Flynn et al., 2017). The current learning process must integrate with interdisciplinary experience cause the demands of a quality learning process are in line with the development and changing times (Berasategi et al., 2020). Integrate of social activities with technology is needed to put the students as active learning agents of developing knowledge (Fantini et al., 2020). Furthermore, the learning process is more contextual and scientific to form the students' character who has a scientific spirit (Sailer et al., 2020).

Instructional collaborative learning methods are effectively used to improve student attitudes and behavior so that students from different ethnic backgrounds can share their respective knowledge and experiences (Slavin, 1989). The Group Investigation (GI) method has been used successfully in Israel, West Germany, the Netherlands, Canada, and Nigeria which consistently improves student achievement

and is positively correlated with social learning and promoting academic activity (Onwuegbuzie et al., 2009; Slavin, 1989, 2009). In addition, the GI method is a successful learning strategy because it involves task specialization in relatively small groups with investigative activities on a particular topic (Mitchell et al., 2008). The implementation of the GI method encourages students to think critically through planning activities, debating, asking questions or problems, and analyzing them to provide solutions.

Research has been part of learning courses for students in Germany since the 1970s and became a reform movement based on the Bologna Declaration to promote the competitiveness of higher education in Europe (Brew, 2006; Brew & Boud, 1995; Brew & Saunders, 2020; European Ministers in charge of Higher Education, 1999; Griffiths, 2004; Jenkins et al., 1998). Research-based learning (RBL) is a learning model that integrates the research process in learning, including activities: search, investigation, discovery, problem-solving, decision making, and writing of academic journals (Afdal & Spernes, 2018; Brew & Saunders, 2020; Healey & Jenkins, 2009). Research-based learning is a teaching method that encourages the use of reasoning power, challenges creativity and intellectuality, and collaboration between teachers and students as a form of responsibility for the quality of learning (Brew, 2003; Fielding & Bragg, 2003; Healey & Jenkins, 2009; Kincheloe, J & Steinberg, S, 1998; Schunk, 2014). The RBL model affects learning outcomes because there is a process of developing personal skills and critical thinking abilities (Brew & Saunders, 2020).

Teaching with data gives the students experience through types of empirical research by paying attention to theoretical foundations and empirical approaches (Wuthisatian & Thanetsunthorn, 2019). Collecting and interpreting data can bridge the gap between classroom learning and the real situation since the teaching with data approach requires students to use certain analytical methods and techniques to reach conclusions, and the data used must come from current real situations (Ray, 2018; Zhuang, 2011). The effectiveness of interactive teaching through classroom projects can be used to develop skills for collaboration, communication, creativity, and thinking. Teaching with data encourages students to be aware of the need for local and global issues, create informed citizens, model conflict and resolution cases, and develop reading, critical thinking, and writing skills.

Student needs to develop their competence through research activities to put them as knowledge creators (Afdal & Spernes, 2018; Niemi & Nevgi, 2014). Research-based learning offers opportunities through social engagement which impacts the discipline and motivates students to be active in deeper levels of learning and understanding so as to support sustainable learning (Strachan et al., 2019; Toom et al., 2010). Integrated research is also needed as a strategic step in increasing the competitiveness of higher education (Wende, 2000). The development of student research abilities is gradually processed from the first year until before graduation (Healey & Jenkins, 2009). Therefore, the development of group investigation with a data research-based learning model is expected to be an alternative learning during the pandemic through online research activities on digital data.

Research Method

In this research, the development of product refers to the research and development hypothetical model modified by Sukmadinata (2017) consisting of 3 stages, namely: 1) preliminary study; 2) product development; and 3) product testing. This research focus on the development validation of the group investigation with a data research-based learning model. This research was carried out through the validation phase of learning experts and limited product trials. Product testing during the pandemic so it was carried out online through the Zoom Meeting, Google Classroom, and Google Forms platforms. The trial subjects in this study involved learning experts to assess the feasibility of developing the syntax of group investigation with a data research-based learning model, lecturers in digital economics courses, and 21 students. The type of data collected is quantitative data related to the assessment of product feasibility by learning experts as well as the performance of lecturers and students during product trials. Meanwhile, qualitative data was obtained from the description of criticism and suggestions given by learning experts

and supporting lecturers. The data collection instrument used a learning expert validation sheet, lecturer performance sheet, and student performance sheet. Descriptive analysis was used to measure the feasibility of the model based on the criteria score, as well as analysis of the performance of lecturers and students.

Result and Discussion

Development of Group Investigation with Data Research-Based Learning Model

John Dewey's notion (Joyce & Weil, 2003) about democracy and education can accommodate students as active learning agents in developing social systems through experience and gradually learning for the advancement of human civilization. Group investigation as cooperative learning involves students from the beginning of planning (topic selection and investigation stages) and requires students to communicate with each other, collaborate, think critically, and solve problems (Joyce & Weil, 2003).

Social activities according to Vygotsky become the main phenomenon that can explain changes in a person's conscious mind so as to form a psychological theory that unites between behavior and mind (Schunk, 2014). The main concept in social learning is the process of investigation and knowledge as a strategy center, but the investigation activity can become useless if educators are the only source of problem identification and plan formulation (Joyce & Weil, 2003). Therefore, students must also actively seek to obtain knowledge independently. In addition, individual knowledge is influenced by social activities because there are interpersonal, cultural-historical, and individual aspects as a factor that affects human development through social interactions and internalization of self-regulation through the transmission of cultural tools. A person's cognitive development and growth process occur due to interpersonal aspects through individual interactions with the surrounding environment that gives stimulation.

There are four quadrants in the RBL model that are differentiated based on the involvement and approaches Healey & Jenkins (2009), among others: (1) research-led; (2) research-oriented; (3) research-tutored; and (4) research-based. This study combines the research-based and research-tutored quadrant which aims to involve students in research discussions and research activities. Different forms of involvement will have implications for different academic achievements. Process and content approaches that focus on student participation place more emphasis on developing critical thinking skills, analytical skills, and personal aspects. The lecturer must pay attention to the resources, infrastructure, and learning objectives so that learning implementation plans can be designed to facilitate the critical reflection process (Brew & Boud, 1995; Brew & Mantai, 2017). Motivation, reflection, participation, and current research become the factors that influence student perceptions in implementing of RBL model (Visser-Wijnveen et al., 2016). RBL allows the students' autonomy to explore but still be under the guidance of the lecturer that supports the development of creativity and critical thinking skills through class interactions, as well as a process of reflection and feedback that deepens understanding of research. (Brew & Saunders, 2020). Students investigate the evidence to reach conclusions and make the learning process more collaborative, problem-solving-oriented, and leads to independent and peer learning. Also, RBL implementation accommodates the creation of dynamic learning evaluation tools so that student learning outcomes are not measured as limited to memorizing facts or ideas (Brew & Saunders, 2020; Koh et al., 2014).

The group investigation developed by Shlomo Sharan (Slavin, 1989) was conducted by dividing students into small groups consisting of 2 (two) to 6 (six) students to carry out planning and project investigations, as well as discussion cooperatively. Subtopic picks by the group and divide the work for each member, then write down the result in reports (Mitchell et al., 2008; Slavin, 1989). Each student will be responsible for a unique part of the overall assignment and ensure individual accountability in working on the group's final project. Group inquiry learning is designed to develop interactions that can eliminate

offense and misunderstanding as an exercise in social life. Every student can be honed, loving, and caring for each other although different degrees of potential, backgrounds, and expectations (Sugiyanto, 2010). The GI method at the higher education level can be more oriented towards analytical activities using guidance as a learning guide (Baki, 2010). Collaborative inquiry-based learning conducted through asynchronous online discussions can be optimized by writing down the results of the investigation (Lämsä et al., 2020). In this case, clear task instructions and report templates are needed to direct students to find the appropriate data and write reports under scientific rules such as writing rules in scientific journals.

The cultural-historical aspects consider that individual thinking can change along with the interaction process and environment. Meanwhile, individual aspects are conditions caused by heredity or default born (physical condition and intelligence). The syntax development of the Group Investigation with Data Research-Based Learning Model refer to the group investigation models that adapted to research-based learning needs and teaching with data methods (Brew & Saunders, 2020; Joyce & Weil, 2003; Sugiyanto, 2010; Wuthisatian & Thanetsunthorn, 2019).

Table 1. The Syntax Development of the Group Investigation with Data Research-Based Learning Model

Stages	Activities
Phase I Apperception with data	<ol style="list-style-type: none"> 1. Describe the objectives/competencies to be achieved 2. Explain the logistics (tools and materials) required in learning 3. Prepare the data to trigger confusing situations
Phase 2 Exploration of Reaction	<ol style="list-style-type: none"> 1. Exploring students' reactions to confusing situations 2. Clarify unclear terms and concepts
Phase 3 Organizing Learning Activities	<ol style="list-style-type: none"> 1. Explain the procedures for data research activities and article writing 2. Selection of topics and plan for cooperation 3. Motivate the student's attention to the data research process
Phase 4 Data Research, Analysis, and Synthesis	<ol style="list-style-type: none"> 1. Organizing students to study 2. Guiding individual and group experiences
Phase 5 Evaluation of Data Research Results	<ol style="list-style-type: none"> 1. Organizing students to present research results and writing articles. 2. Evaluating the results of data research and writing articles
Phase 6 Reflection and Reward	<ol style="list-style-type: none"> 1. Give appreciation to each group 2. Reflect, reinforce, and conclude
Social System:	
The data research-based learning model refers to a social system based on democratic processes and group decisions, so the intervention from outside of the group is very low and teacher's role as mediator, facilitator, and motivator (Joyce & Weil, 2003). The data used as a trigger for the situation comes from the real world and is not forced so the reactions to confusing situations become authentic and lead to the negotiation process (Joyce & Weil, 2003; Wuthisatian & Thanetsunthorn, 2019).	
Principle of Reaction:	
The teacher as a facilitator is tasked with directing individuals to group processes (helping students formulate plans, acting, managing groups) and data research requirements. This confusing situation triggers students to carry out data research by collecting relevant data. Teachers assist in the process of data research and article writing because the diversity of individuals in the group affects student cohesiveness and performance.	
Support System:	
Students need internet access, laptops/smartphones, and rooms with a power source to support an effective learning process.	
Accompaniment Impact:	
The data research-based learning model is designed to train students' abilities in finding, processing,	

interpreting, and presenting data that can be used to solve daily problems (Wuthisatian & Thanetsunthorn, 2019). Assignments in the form of writing articles can help students to practice scientific writing skills (Afdal & Spernes, 2018). Data research-based learning models can also minimize student misconceptions between theory and practice in the world of work through the literature review process (Hoffer, 2019).

Validation Result

Validation used to determine the feasibility of developing a group investigation learning model based on data research conducted by learning experts regarding the suitability of the theory used. The validation was executed by at least 2 (two) learning experts. The validation sheet consists of seven (7) assessment aspects including supporting theory, syntax, social system, principle of reaction, support system, accompaniment impact, and learning implementation. Assessment by experts using a Likert scale with a range of 1 (Strongly Disagree) to 5 (Strongly Agree).

Table 2. Validation Results by Learning Experts

No	Aspect	Mean	Category
1.	Supporting Theory	4.50	Very Good
2.	Syntax	4.38	Very Good
3.	Social System	4.38	Very Good
4.	Principles of Reaction	4.20	Good
5.	Support System	4.17	Good
6.	Accompaniment Impact	4.50	Very Good
7.	Learning Implementation	4.33	Very Good
Sum of Mean		4.35	Very Good

Based on the table above, it can be seen that the results of the validation by learning experts as a whole got an average value of 4.35 which was included in the very good category, so it can be concluded that the overall draft of the development of the group investigation with data research-based learning model is feasible and ready to be used in limited trials.

Product Trial Results

Product trials were conducted on a limited basis by the lecturer on 21 students enrolled in the digital economy course. The limited trial aims to determine the implementation of the group investigation with data research-based learning model. The results of the observations in the limited trial can be seen in the following table.

Table 3. Limited Trial Observation Results

No	Aspect	Score	Category
1	Lecturers Performance	86	Good
2	Students Activities	81	Good

Based on the observations from the limited trial, it is known that the performance of lecturers and student activities are in a good category so that the group investigation with data research-based learning model that has been developed is suitable for wider use. After the limited trial was carried out, discussions were held with the lecturers and produced several findings which were taken into consideration for improvement as follows.

Table 4. Suggestions

Suggester	Suggestion	Revision
Lecturers	Writing templates are needed as a guide to make it easier for students to write research reports.	Implementation of the group investigation with data research-based learning model equipped with research report template.
	Students need to be advised to check for plagiarism to reduce the level of plagiarism.	The assignment instructions are accompanied by an appeal that the writing of research articles will be carried out with a plagiarism test.

The use of applications that can measure the level of plagiarism as an indicator of learning assessment is useful for practicing critical thinking skills both in written content, writing systematics, and citations (Johari et al., 2015; Li & Li, 2017). Students will be more careful in doing citations and must be orderly by including every written reference source. The habit of avoiding plagiarism can also be useful for students to learn and better respect the ownership rights of ideas or copyrights belonging to others that are protected by laws and regulations (Vie, 2013).

The group investigation with data research-based learning model accommodates the development of 21st-century digital skills through exploring digital content activities that require critical thinking skills, information management, and information evaluation so that students can gain knowledge and skills that systematically approach and reflect on research activities (Afdal & Spernes, 2018). The group investigation with data research-based learning model guides students comprehensively to find data that can be analyzed according to the purposes of writing (similar themes or time chronology) that provide predictive value or draw conclusions.

The development of digital skills is a vital need that can support students to stream data in real-time, find insights in the data, and then be able to analyze it for decision-making purposes (Igor, D., & Aleksandr, 2020). Through data research activities, students are expected to be able to maintain the up-to-date knowledge available online, such as scientific publications in journals and digital libraries. The alignment of skills development through RBL or research projects allows students to link theory and practice directly (Ifenthaler & Gosper, 2014). Assignment instructions and writing templates are given to students aimed to train the students' abilities in writing research results under academic rules. Research-based learning provides benefits in the form of student autonomy to take over learning independently (Brew & Saunders, 2020).

The group investigation with data research-based learning model also demands the development of student academic activity through digital communication media and digital collaboration to solve a problem creatively so that students increasingly appreciate the ability to reflect and collaborate with others (van Ingen & Ariew, 2015). Activities in the group investigation with data research-based learning model are designed in groups so that students can exchange knowledge with each other. Research activities can be new for students so that student understanding depends on cultural factors, emotional intelligence, leadership skills, behavior, and student knowledge sharing that affect team performance (Jamshed & Majeed, 2019).

Peer learning provides opportunities for students to be involved with each other and feel more comfortable when asking friends than directly to the teacher. Although group learning raises the problem of social laziness with the assumption that other members in the group will take over the responsibility (Chou & Ramser, 2019). Students who already feel neglected will be more vulnerable to being inactive in class and the group learning process. Learning motivation reflects the performance that affects students in adjusting, both academically and socially (Olivier et al., 2018). Lecturers and researchers need to realize

that learning must be designed to accommodate student readiness to carry out research practices professionally. Therefore, at each meeting students are asked to post writing progress through Google Classroom media so that it can be monitored by lecturers.

Strengths

1. Digital data research activities available online can be an alternative solution when it is constrained to conduct research directly.
2. Students learn to write research reports such as systematic writing of scientific journals.
3. Students take over learning independently.

Weaknesses

1. The effectiveness of the data research-based group investigation learning model has not been widely tested because it is still limited to small group user trials.
2. The trial is still limited to 1 lecture material.
3. Lazy students tend to be inactive.

Conclusion

The group investigation with data research-based learning model was developed by combining the syntax of the group investigation cooperative learning model, research-based learning objectives, and the principles of teaching with data. The goal is to train students to learn, think, understand, and relate data to each other. Students are introduced to research activities based on digital data to practice 21st-century digital skills and student academic activities. The syntax of the group investigation with data research-based learning model: (1) apperception with data; (2) exploration of reaction; (3) organizing learning activities; (4) research, analysis, and synthesis; (5) evaluation of research results; and (6) reflection and reward. The developed model has been validated by learning experts and the result was in very good category reviewed by the feasibility of supporting theories, syntax, social systems, reaction principles, support systems, learning impacts, accompaniments impact, and learning implementation. The developed model is also proven to be feasible based on limited trials so it needs to be tested more broadly.

References

- Afdal, H. W., & Spernes, K. (2018). Designing and redesigning research-based teacher education. *Teaching and Teacher Education*, 74, 215–228. <https://doi.org/10.1016/j.tate.2018.05.011>
- Aguilera-Hermida, A. P. (2020). College students' use and acceptance of emergency online learning due to COVID-19. *International Journal of Educational Research Open*, 1(September), 100011. <https://doi.org/10.1016/j.ijedro.2020.100011>
- Alam, G. M., Forhad, A. R., & Ismail, I. A. (2020). Can education as an 'International Commodity' be the backbone or cane of a nation in the era of fourth industrial revolution? - A Comparative study. *Technological Forecasting and Social Change*, 159(May), 120184. <https://doi.org/10.1016/j.techfore.2020.120184>
- Ali, I. (2020). The COVID-19 Pandemic: Making Sense of Rumor and Fear: Op-Ed. *Medical Anthropology: Cross Cultural Studies in Health and Illness*, 39(5), 376–379. <https://doi.org/10.1080/01459740.2020.1745481>
- Baki, A. (2010). The Application of Group Investigation Technique: The Views of the Teacher and Students. *The Application of Group Investigation Technique: The Views of the Teacher and Students*, 1(2), 166–186. <https://doi.org/10.16949/turcomat.71332>
- Berasategi, N., Aróstegui, I., Jaureguizar, J., Aizpurua, A., Guerra, N., & Arribillaga-Iriarte, A. (2020). Interdisciplinary learning at university: Assessment of an interdisciplinary experience based on the

- case study methodology. *Sustainability (Switzerland)*, 12(18), 1–10. <https://doi.org/10.3390/su12187732>
- Brew, A. (2003). Teaching and research: New relationships and their implications for inquiry-based teaching and learning in higher education. *Higher Education Research and Development*, 22(1), 3–18. <https://doi.org/10.1080/0729436032000056571>
- Brew, A. (2006). Research and teaching: Changing relationships in a changing context. *Studies in Higher Education*, 24(3), 291–301. <https://doi.org/10.1080/03075079912331379905>
- Brew, A., & Boud, D. (1995). *Teaching and research : Establishing the vital link with learning*. 261–273.
- Brew, A., & Mantai, L. (2017). Academics' perceptions of the challenges and barriers to implementing research-based experiences for undergraduates. *Teaching in Higher Education*, 22(5), 551–568. <https://doi.org/10.1080/13562517.2016.1273216>
- Brew, A., & Saunders, C. (2020). Making sense of research-based learning in teacher education. *Teaching and Teacher Education*, 87, 102935. <https://doi.org/10.1016/j.tate.2019.102935>
- Chou, S. Y., & Ramser, C. (2019). Becoming motivated to be a good actor in a student project team: A theoretical investigation of student citizenship behavior and the use of peer evaluations. *Journal of International Education in Business*, 12(1), 65–79. <https://doi.org/10.1108/JIEB-03-2018-0008>
- European Ministers in charge of Higher Education. (1999). *Bologna Declaration*. www.eurashe.eu
- Fantini, P., Pinzone, M., & Taisch, M. (2020). Placing the operator at the centre of Industry 4.0 design: Modelling and assessing human activities within cyber-physical systems. *Computers and Industrial Engineering*, 139(February 2018), 105058. <https://doi.org/10.1016/j.cie.2018.01.025>
- Fielding, M., & Bragg, S. (2003). Student as Researchers: Making a Difference. *Cambridge: Pearson Pub*, April, 37–55. https://www.researchgate.net/publication/42794860_Student_as_Researchers_Making_a_Difference
- Flynn, J., Dance, S., & Schaefer, D. (2017). Industry 4.0 and its potential impact on employment demographics in the UK. *Advances in Manufacturing Technology*, 31, 239–244. <https://doi.org/10.3233/978-1-61499-792-4-239>
- Griffiths, R. (2004). Knowledge production and the research-teaching nexus: The case of the built environment disciplines. *Studies in Higher Education*, 29(6), 709–726. <https://doi.org/10.1080/0307507042000287212>
- Healey, M., & Jenkins, A. (2009). *Developing undergraduate research and inquiry*. Higher Education Academy.
- Hoffer, A. J. (2019). Using data and research to address student misconceptions. *International Review of Economics Education*, 31(January), 100156. <https://doi.org/10.1016/j.iree.2019.100156>
- Ifenthaler, D., & Gosper, M. (2014). Curriculum Models for the 21st Century. *Curriculum Models for the 21st Century*. <https://doi.org/10.1007/978-1-4614-7366-4>
- Igor, D., & Aleksandr, K. (2020). *122-Текст смамми-322-1-10-20200703.pdf* (pp. 8–17). Theory and history of public administration. <https://doi.org/10.34213/ap.20.01.01>
- Iivari, N., Sharma, S., & Ventä-Olkkonen, L. (2020). Digital transformation of everyday life – How COVID-19 pandemic transformed the basic education of the young generation and why information management research should care? *International Journal of Information Management*, 55(June), 102183. <https://doi.org/10.1016/j.ijinfomgt.2020.102183>
- Jamshed, S., & Majeed, N. (2019). Relationship between team culture and team performance through lens of knowledge sharing and team emotional intelligence. *Journal of Knowledge Management*, 23(1), 90–109. <https://doi.org/10.1108/JKM-04-2018-0265>
- Jenkins, A., Blackman, T., Lindsay, R., & Paton-Saltzberg, R. (1998). Teaching and Research: Student perspectives and policy implications. *Studies in Higher Education*, 23(2), 127–141. <https://doi.org/10.1080/03075079812331380344>
- Johari, F., Alias, M. H., Rahman, A. A., & Ibrahim, M. F. (2015). The Usage of 'Turnitin' as an Innovative Educational Tool: Inculcating Critical Thinking in Integrating Naqli and Aqli for Subject of Malaysian Economy. *Procedia - Social and Behavioral Sciences*, 195, 821–827. <https://doi.org/10.1016/j.sbspro.2015.06.186>

- Joyce, B., & Weil, M. (2003). Attaining concepts: The basic thinking skills. *Models of Teaching*, 161–178.
- Kincheloe, J. L., & Steinberg, S. R. (1998). *Students as researchers: creating classrooms that matter*. Routledge Falmer.
- Koh, N., Reddy, V., & Chatterji, M. (2014). Understanding validity issues surrounding test-based accountability measures in the US. *Quality Assurance in Education*, 22(1), 42–52. <https://doi.org/10.1108/QAE-12-2013-0051>
- Lämsä, J., Hämäläinen, R., Koskinen, P., Viiri, J., & Mannonen, J. (2020). The potential of temporal analysis: Combining log data and lag sequential analysis to investigate temporal differences between scaffolded and non-scaffolded group inquiry-based learning processes. *Computers and Education*, 143(August 2019). <https://doi.org/10.1016/j.compedu.2019.103674>
- Li, M., & Li, J. (2017). Online Peer Review Using Turnitin in First-Year Writing Classes. *Computers and Composition*, 46, 21–38. <https://doi.org/10.1016/j.compcom.2017.09.001>
- Mitchell, M. G., Montgomery, H., Holder, M., & Stuart, D. (2008). Group investigation as a cooperative learning strategy: An integrated analysis of the literature. *Alberta Journal of Educational Research*, 54(4), 388–395.
- Niemi, H., & Nevgi, A. (2014). Research studies and active learning promoting professional competences in Finnish teacher education. *Teaching and Teacher Education*, 43, 131–142. <https://doi.org/10.1016/j.tate.2014.07.006>
- Olivier, E., Archambault, I., & Dupéré, V. (2018). Boys' and girls' latent profiles of behavior and social adjustment in school: Longitudinal links with later student behavioral engagement and academic achievement? *Journal of School Psychology*, 69(December 2016), 28–44. <https://doi.org/10.1016/j.jsp.2018.05.006>
- Onwuegbuzie, A. J., Collins, K. M. T., & Jiao, Q. G. (2009). Performance of cooperative learning groups in a postgraduate education research methodology course: The role of social interdependence. *Active Learning in Higher Education*, 10(3), 265–277. <https://doi.org/10.1177/1469787409343190>
- Ray, M. (2018). Teaching economics using 'Cases' – Going beyond the 'Chalk-And-Talk' method. *International Review of Economics Education*, 27, 1–9. <https://doi.org/10.1016/j.iree.2017.12.001>
- Sailer, M., Schultz-Pernice, F., & Fischer, F. (2020). Jo ur na l P re of. *Computers in Human Behavior*, 135907. <https://doi.org/10.1016/j.chb.2021.106794>
- Saravanan, M. (2020). Economics of Internationalisation of Higher Education in the Post-Pandemic Era. *Journal of Development Economics and Management Research Studies*, 5(5), 53–60.
- Schunk, D. H. (2014). *Learning theories : an educational perspective / Dale H. Schunk*.
- Slavin, R. E. (1989). Research on Cooperative Learning: An international perspective. *Scandinavian Journal of Educational Research*, 33(4), 231–243. <https://doi.org/10.1080/0031383890330401>
- Slavin, R. E. (2009). Research on cooperative learning. *ASHE-ERIC Higher Education Report*, 20(4), 27–55. <https://doi.org/10.1002/aehe.3640200407>
- Strachan, S. M., Marshall, S., Murray, P., Coyle, E. J., & Sonnenberg-Klein, J. (2019). Using Vertically Integrated Projects to embed research-based education for sustainable development in undergraduate curricula. *International Journal of Sustainability in Higher Education*, 20(8), 1313–1328. <https://doi.org/10.1108/IJSHE-10-2018-0198>
- Sugiyanto. (2010). *Model-model pembelajaran inovatif*. Yuma Pustaka.
- Sukmadinata, N. S. (2017). *Metodologi penelitian pendidikan*. Remaja Rosdakarya.
- Toom, A., Kynäslähti, H., Krokfors, L., Jyrhämä, R., Byman, R., Stenberg, K., Maaranen, K., & Kansanen, P. (2010). Experiences of a research-based approach to teacher education: Suggestions for future policies. *European Journal of Education*, 45(2), 331–344. <https://doi.org/10.1111/j.1465-3435.2010.01432.x>
- van Ingen, S., & Ariew, S. (2015). Making the invisible visible: Preparing preservice teachers for first steps in linking research to practice. *Teaching and Teacher Education*, 51, 182–190. <https://doi.org/10.1016/j.tate.2015.07.001>
- van Laar, E., van Deursen, A. J. A. M., van Dijk, J. A. G. M., & de Haan, J. (2017). The relation between

- 21st-century skills and digital skills: A systematic literature review. *Computers in Human Behavior*, 72, 577–588. <https://doi.org/10.1016/j.chb.2017.03.010>
- Vie, S. (2013). A Pedagogy of Resistance Toward Plagiarism Detection Technologies. *Computers and Composition*, 30(1), 3–15. <https://doi.org/10.1016/j.compcom.2013.01.002>
- Visser-Wijnveen, G. J., van der Rijst, R. M., & van Driel, J. H. (2016). A questionnaire to capture students' perceptions of research integration in their courses. *Higher Education*, 71(4), 473–488. <https://doi.org/10.1007/s10734-015-9918-2>
- Wende, M. C. V. A. N. D. E. R. (2000). *The Bologna Declaration : Enhancing the Transparency and Competitiveness of European Higher Education* 1. XXV(3). <https://doi.org/10.1080/03797720020015890>
- Wuthisatian, R., & Thanetsunthorn, N. (2019). Teaching macroeconomics with data: Materials for enhancing students' quantitative skills. *International Review of Economics Education*, 30. <https://doi.org/10.1016/j.iree.2018.11.001>
- Zhuang, H. (2011). Teaching With Data In The Principles Of Macroeconomics Course. *American Journal of Business Education (AJBE)*, 5(1), 25–28. <https://doi.org/10.19030/ajbe.v5i1.6700>

Copyrights

Copyright for this article is retained by the author(s), with first publication rights granted to the journal.

This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>).