WWJMRD 2021; 7(6): 15-18
www.wwjmrd.com
International Journal
Peer Reviewed Journal
Refereed Journal
Indexed Journal
Impact Factor SJIF 2017: 5.182 2018: 5.51, (ISI) 2020-2021: 1.361
E-ISSN: 2454-6615
DOI 10.17605/OSF.IO/3C2VP

Kustori
Universitas Negeri Surabaya
Surabaya, Indonesia.

Rusijono
Universitas Negeri Surabaya
Surabaya, Indonesia.

Andi Mariono
Universitas Negeri Surabaya
Surabaya, Indonesia.

Fajar Arianto
Universitas Negeri Surabaya
Surabaya, Indonesia.

Correspondence:
Kustori
Universitas Negeri Surabaya
Surabaya, Indonesia.

Developing Procedural Skills with Practice-Based Learning in Vocational Education

Kustori, Rusijono, Andi Mariono, Fajar Arianto

Abstract
Practice-based learning is about making learning environment as realistic as possible and requires students to show what they know and relate theory and practice. This is because practice-based learning can produce graduates who are ready to use in the world of work. Learning orientation prioritizes practical activities, so this learning is closely related to procedural abilities or skills because almost all of them use practice in learning. Therefore, the purpose of this study was to determine the relation between practice-based learning and procedural skills. The data analysis technique was by comparing the students' pretest and posttest using the mean test. The research subjects in this research were 50 students from each of 2 classes with the results of this study that a practice-based learning model was declared effective to improve the ability to apply procedural skills.

Keywords: Practice-based learning, procedural skill, vocational education.

Introduction

According to Joyce, Weil, & Calhoun (2009) the learning model is a description of a learning environment that includes teacher behavior when learning model is applied. According to Arends (2008), a model is a plan or pattern, which is comprehensive, to help students. Meanwhile Eggen, Kauchar, & Harder (1979) suggested that learning model provides a framework and direction for teachers to teach. Thus it can be concluded that learning model is a conceptual framework that describes a systematic procedure for organizing learning experiences to achieve specific learning objectives and serves as a guide for instructional designers and teachers in planning teaching and learning activities.

In 1960s, Edgar Dale theorized that students retained more information about what they did than what they heard, read or observed. His research then led to the development of the cone of experience. According to Dale, the least effective method is at the top, involving learning from the information presented through verbal symbols, namely listening to the words spoken. The most effective methods are at the bottom, involving direct and purposeful learning experiences, such as hands-on or field experiences. Immediate goal experiences represent realities or things that are hidden from real everyday life. Dale's (1969) experience cone maps mean retention rates for various teaching methods. The further down the cone, the greater learning and more information that may be stored. It also suggests that when choosing a learning method, it is important to remember that engaging students in the process strengthens knowledge retention. This shows that learning techniques by doing generate retention of up to 90%. According to Dale, instructors must design instructional activities that build on real-life experiences.

From Edgar Dale's opinion, University of South Australia (2016) emphasizes that, practice-based learning is about making learning environment as realistic as possible and requires students to demonstrate what they know and relate theory and practice. Meanwhile, According to (QAA Scotland, 2011), practice-based learning is learning that is explicitly designed to relate to professional practice standards. This includes learning that is work-based, placement and which aims to increase student employability. Thus, practice-based learning is learning that is explicitly designed to link professional practice standards and learning environments as realistic as the world of work.

Practice-based learning has principles whereby workplace learning in either paid or unpaid positions, learning through participation in industry-based assignments and / or projects as part of the curriculum, learning skills for career management as part of their curriculum, learning through activities in class time that mimics the activities carried out by a professional (e.g. the laboratory has appropriate dress standards, safety procedures, standard operating procedures, quality control), learning skills in using software that are identical to those used by professional learning practitioners, learning through simulation workplace environment as part of their curriculum, assessment and feedback on Graduate Quality indicators that have been mapped to professional competence, teaching staff in practicing courses are professionals to provide opportunities to share their experiences during class, cadets can connect with their professional bodies and their ethics; code of ethics as part of curriculum activities (University of South Australia 2016).

Practice-based learning is intended for work-oriented education. Practice-based learning is very common in America, Europe or Australia. This is because practice-based learning can produce graduates who are ready to use in the world of work. Antioch University (2016) has implemented this practice-based learning in the areas of Clinical Mental Health Counseling, Clinical Psychology, Teacher Certification, and Environmental Studies.

Practical learning is the same as other learning which is always related, especially with procedural skills. In general, there are 4 different views regarding the relation between conceptual knowledge and procedural knowledge (Baroody, 2003). First of all, it states that someone acquires conceptual knowledge first and then derives and develops procedural knowledge (Gelman & Williams, 1998). Second, states that a person acquires procedural knowledge first and then gradually acquires conceptual knowledge through a process of abstraction (Karmiloff-Smith, 1992; Siegler & Stern, 1998). Third, also called the inactivation view, states that conceptual knowledge and procedural knowledge are built independently without interacting with each other (Resnick L., 1982; Resnick & Omanson, 1987). Fourth, also called iterative view, states that the relation between the two is a two-way relationship that affects each other. Increasing conceptual knowledge will help increase procedural knowledge, and vice versa.

Kurnia (2014) said that students easily remember the concepts obtained to be applied. In addition, Mursid (2013) states that the improvement of production-oriented competencies that is effective in practical teaching requires both an Understanding of the Concept and the Application of Procedures. Paryanto (2013) shows that the integration of character aspects is 70% entrenched. Thus, practice-based learning is a logical solution for improving procedural skills. Based on the reasons that have been stated, efforts are needed to develop new learning models that are in accordance with practice-based learning approaches to improve procedural skills.

Materials and methods

This study uses a weak experiment method with practice-based learning with a one group pretest-posttest design. Students are treated with practice-based learning for six weeks. The subjects of this study were 50 students at Surabaya Aviation Polytechnic. The data analysis technique was by comparing the students' pretest and posttest using the mean test.

Result and Discussion

The results of data analysis using the t test, showed that there was an increase in students' procedural skills, in table 2, it shows sig, 0.000 (<, 0.05). In table 1, it shows that the mean pretest of students before being taught by practicum-based learning obtained a mean of 76.70, and after that it has increased by 88.60. This result is possible because practice-based learning occurs in meaningful contexts (Brown and Duguid, 1991).

This result is possible because practice-based learning occurs in meaningful contexts (Brown and Duguid, 1991). Yakhlef (2010) argues that practice-based learning combines materialized learning facilities and presents opportunities for worker-students to reflect on what has been experienced and imagined (Yakhlef, 2010). Huggins (2017) suggests that practice-based learning is strong in terms of providing opportunities for worker-learners to apply the knowledge and skills they acquire from various sources, including from the workplace itself and from outside. In addition, when practice reflection is facilitated, learning can become richer especially through direct mentoring by more experienced colleagues (Billett, 1999). There are bilateral benefits from two-way learning and knowledge sharing between beginners and experts in the same practice (O'Donovan, 2018). Based on the analysis of the posttest data of the experimental group, it was known that the ability to apply the procedure, 95.45% of cadets were successful. These results indicate that the majority of students or more than 70% of students are able to pass the standart score. However, this data does not necessarily measure that this learning model is effective and has a bilateral relation. However, it can be an early indication that this learning is effective. If the calculation results show that the majority of students do not reach the standart score, then there is no doubt that this learning model is ineffective.

Table 1: Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	pretest	76.7000	50	1.35902	.19219
	posttest	88.6000	50	1.51186	.21381

Table 2: Paired Samples Test

		Pair 1
		pretest - posttest
Paired Differences	Mean	-11.90000
	Std. Deviation	1.99233
	Std. Error Mean	.28176

	95% Confidence Interval of the Difference	Lower	-12.46621
		Upper	-11.33379
t			-42.235
df			49
Sig. (2-tailed)			.000

Conversely, if the majority of students reach the standard score, then this learning model can be effective or not. This happens because the students' initial abilities are not considered. It could be that students who are given this model have high initial abilities. So that from the beginning they had indeed reached the standard score. Therefore, an analysis of the pretest data is also needed to strengthen the initial indication that this model is effective and has a relation with procedural skills in students. Based on the pretest and posttest data analysis of the experimental class using an average n-gain score, the ability to apply procedural skills is 0.922 which is included in the high category. The results of these calculations reinforce previous indications that learning model developed is effective and has a strong relation. Even so, the presumption of the effectiveness of this learning model is not yet strong enough to consider the data in the control group where all variables are controlled. What distinguishes only learning variables model. Because it may not be a learning model developed which is the reason that majority of students succeed in achieving competence.

Practice-based learning provides a unique and direct link between the workplace and its needs, and students' professional aspirations, increasing the relevance of conventional courses of study. Practice-based learning builds a curriculum around what knowledge and learning is valued and needed by individuals and the workplace of higher education institutions (Baker et al., 2017). Many higher education institutions have developed initiatives aimed at enabling students to acquire relevant skills, knowledge and experience in practical professional scenarios that will increase the likelihood of higher education institutions finding employment (Attwood, 2009). The development of partnerships between universities and entrepreneurs is an important factor in identifying learning needs (Helyer, 2011) and increasing the relevance of education, especially in facing challenges presented by economic models, technological advances and other social changes.

There is evidence from Australia and the UK that practice-based learning can be seen as a post-secondary educational innovation that seeks to engage seriously with the economic, social and educational demands of our time. Boud (2001) identifies traits of practice-based learning that highlight the importance of partnerships between external organizations and educational institutions to foster employee and student learning. Practice-based learning projects are negotiated and derived from the needs of the workplace and students rather than traditional concepts from disciplinary curriculum. A major aspect of work-based programming is the relation between individual learning and organizational change (Garnett et al., 2016).

Abraham (2012) observes that practice-based learning appears to focus on workplace learning by individuals or as a team for the purpose of applying procedural skills. He introduced the concept of "applied work learning" to bring about organizational change through a combination of action research and action learning. Therefore, the two main objectives of the intervention project as reported in this study are to advance student learning and bring about organizational change through the application of theoretical knowledge and engagement with corporate issues of a procedural nature.

The basic idea for this model is a dialogue between students' learning experiences at work and a more theoretical understanding of universities to develop effective practices (Major, 2016; Lester and Costley, 2010). In this sense, Practice-based learning curriculum arise from agendas and needs in the workplace, much as from learning objectives that educational institutions establish for students.

Conclusions

Based on the research that has been done, the suggestions that can be given by researchers are that even though the model developed is effective and has a strong relation, if it is examined in more detail, there are several components of the model that still have the potential to be improved. In addition, testing the effectiveness of the model in this study only involved two classes. So, it is hoped that this model can be tested again for its effectiveness on a broader and massive scale.

References

1. Abraham, S. C. (Ed.). *Strategic planning: A practical guide for competitive success*. Emerald Group Publishing. (2012).
2. Antioch University. *Practice based learning*. From http://www.antiochne.edu/aboutane/practice/ (2016)
3. Arends, R. I. *Learning to teach: edisi terjemahan.* Yogyakarta: Pustaka Pelajar. (2008).
4. Baroody, A. J. *The development of adaptive expertise and flexibility: the integration of conceptual and procedural knowledge.* Mahwah, NJ: Erlbaum. (2003).
5. Billett, S. Work as social practice: activities and interdependencies. *Changing Practice Through Research: Changing Research Through Practice*, (1999). *2*, 128-38.
6. Boud, D. Using journal writing to enhance reflective practice. *New directions for adult and continuing education*, (2001). 90, 9-18.
7. Brown, J. S., & Duguid, P. Organizational learning and communities-of-practice: Toward a unified view of working, learning, and innovation. *Organization science*, (1991). *2*(1), 40-57.
8. Dale, E. Audiovisual methods in teaching. (1969).
9. Eggen, P., Kauchar, D., & Harder, R. J. *Strategies for teachers: information processing in the classroom.* Englewood Cliffs, N.J.: Prentice-Hall. (1979).
10. Garnett, J. Work-based learning. *Higher Education, Skills and Work-Based Learning*. (2016).
11. Gelman, R., & Williams, E. M. Enabling constraints for cognitive development and learning: domain specificity and epigenesis. Dalam D. Kuhn, & R. Siegler, *Handbook of Child Psychology: Cognition, Perception, and Language (5th edn, Vol. 2)*. New York: John Wiley. (1998), 575-630.

12. Helyer, R. Aligning higher education with the world of work. *Higher Education, Skills and Work-Based Learning*. (2011).
13. Huggins, S. Practice-based learning in higher education. *Library Trends*, (2017), *66*(1), 1-12.
14. Joyce, B., Weil, M., & Calhoun, E. *Models of teaching.* USA: Allyn and Bacon. (2009).
15. Karmiloff-Smith, A. *Beyond modularity: a developmental perspective on cognitive science.* Cambridge, MA: MIT Press. (1992).
16. Kurnia, S. *Pengaruh Penerapan Strategi Pembelajaran Aktif Tipe Active Knowledge Sharing Terhadap Pemahaman Konsep Matematis Siswa Kelas VIII SMPN 4 Kota Solok* (Doctoral dissertation, STKIP PGRI Sumatera Barat). (2014).
17. Mursid, R. *Pengembangan model pembelajaran praktik berbasis kompetensi berorientasi produksi.* Medan: Universitas Negeri Medan. (2013).
18. O'Donovan, D. Bilateral benefits: Student experiences of work-based learning during work placement. *Industry and Higher Education*, (2018), *32*(2), 119-128.
19. Paryanto, e. a. *Model pembelajaran competence based training (CBT) berbasis karakter untuk pembelajaran praktik.* Yogyakarta: Universitas Negeri Yogyakarta. (2013).
20. QAA Scotland. *Key aspects of practice-based learning in teaching, nursing and social work in Scotland.* Glasgow: The Quality Assurance Agency Scotland. From http://www.qaa.ac.uk/en/Publications/Documents/practice-based-learning-guide.pdf (2011).
21. Resnick, L. B., & Omanson, S. F. Learning to understand arithmetic. Dalam R. Glaser, *Advances in Instructional Psychology Vol. 3*.Hillsdale, NJ: Erlbaum. (1987).
22. University of South Australia. *Practice based learning*. From http://w3.unisa.edu.au/academicdevelopment/engagement/practice.asp (2016).
23. Yakhlef, A. The corporeality of practice-based learning. *Organization Studies*, (2010), *31*(4), 409-430.