IMPLEMENTATION OF RISK MANAGEMENT FOR OUTCOME-BASED LEARNING

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Abstract

This classroom action research discusses the application of risk management in delivering results-based learning. The author uses a conceptual model development approach and examples of application in a course. This research is essential to guide the teaching team in conducting risk management to achieve learning outcomes by developing conceptual models. The study results show that the teaching team that carries out risk management in the learning process can guarantee more in achieving Graduate Learning Outcomes and Course Learning Outcomes. Furthermore, the teaching team continuously improves learning outcomes through the Plan-Do-Check-Act (PDCA) cycle. This conceptual model's development helps teaching staff identify, assess, evaluate, and control risks and enhance learning objectives.

Keywords: Risk management; Outcome-based learning; PDCA cycle; Continuous improvement.

Abstrak

Penelitian tindakan kelas ini membahas penerapan manajemen risiko dalam penyampaian pembelajaran berbasis hasil. Penulis menggunakan pendekatan pengembangan model konseptual dan contoh penerapan di sebuah mata kuliah. Penelitian ini penting untuk memandu bagaimana tim pengajar menerapkan manajemen risiko untuk pencapaian hasil belajar melalui pengembangan model konseptual. Hasil penelitian menunjukkan bahwa tim pengajar yang melakukan manajemen risiko di proses pembelajaran dapat lebih menjamin dalam pencapaian Capaian Pembelajaran Lulusan dan Capaian Pembelajaran Mata Kuliah. Selanjutnya, tim pengajar melakukan peningkatan capaian pembelajaran secara berkelanjutan melalui siklus *Plan-Do-Check-Act* (PDCA). Pengembangan model konseptual ini bermanfaat memandu staf pengajar dalam mengidentifikasi, menilai, mengevaluasi, dan pengendalian risiko serta peningkatan tujuan pembelajaran.

Kata Kunci: Manajemen risiko; Pembelajaran berbasis hasil; siklus PDCA; peningkatan berkelanjutan

INTRODUCTION

Risk management as a management tool allows teaching staff to design and control processes or activities by taking advantage of opportunities and avoiding potential threats of failure in achieving goals (Miller & Waller, 2003). Risk management is systematically identifying, assessing, monitoring, and mitigating risks in various processes or activities of educational organizations, including learning

processes (Bucelli et al., 2018). Risk management is an iterative process of determining appropriate risk controls for achieving objectives. Quality management system standard - ISO 9001:2015 states that the entire process or activity must carry out risk-based thinking and use the Plan-Do-Check-Act (PDCA) cycle to improve process performance continuously (ISO, 2015). The ISO Standard 31000:2019 also states that risk must be related to the organizational context (Vorst et al., 2018).

Several studies on risk management related to the achievement of the performance of non-educational organizations, such as those conducted by Bucelli et al. (2018), discussed the application of risk management to mitigate environmental pollution, reduce the effects of uncertainty on rising electricity production costs (Falbo et al., 2010), and reduce the potential risk of cargo ship accidents (Akyildiz & Mentes, 2017).   Meanwhile, research related to risk management in educational organizations is still rare, even if there is it is still limited to discussing risk management for university-industry collaboration performance; the behavior students attending finance courses have a positive attitude towards risk management (Le Fur & Outreville, 2022), and the importance of the curriculum for undergraduate study programs in business management, financial management, industrial psychology, and communication to include risk management courses in their learning process (Marx & de Swardt, 2023). This research complements research on risk management in educational organizations, particularly about the delivery of Outcome-based Learning.

Outcome-based learning assessment is the competency achievement of students during the learning process (Dayananda & Latte, 2021). Outcome-based learning starts with curriculum design and development, implementation and assessment, and continuous improvement of learning quality (MacKenzie Jr et al., 2019). A results-based learning approach allows educational organizations or curriculum development study programs to consider the needs and expectations of interested parties, such as students and graduate users (Gunarathne et al., 2019).

Educational organizations that adopt the ISO 21001: 2018 Education organization management system must have risk management at the level of study program management units and study programs (Badan Standardisasi Nasional, 2019). Because the organizational context is dynamic, educational organizations must be responsive to environmental changes to achieve educational goals. For this reason, organizations need risk management to reduce the failure to achieve quality education services (Arena et al., 2017). Meanwhile, at the study program level, study programs manage risk to ensure the creation of graduate competencies (Learning Outcome). Meanwhile, at the operational level, teaching staff must manage risks related to results-based course learning so that student competencies are achieved following course learning outcomes.

By considering the benefits obtained in the organization and study program, this study discusses the application of risk management in the learning process. Teaching staff as risk owners have an essential role in achieving results-based learning. For this reason, through the development of a conceptual model, this study aims to provide stages for the teaching team in compiling risks, measuring learning outcomes, analyzing and evaluating learning outcomes, and improving learning performance on an ongoing basis.

RESEARCH METHODS

Figure 1 shows the classroom action research approach to applying risk management for results-based learning in a course.
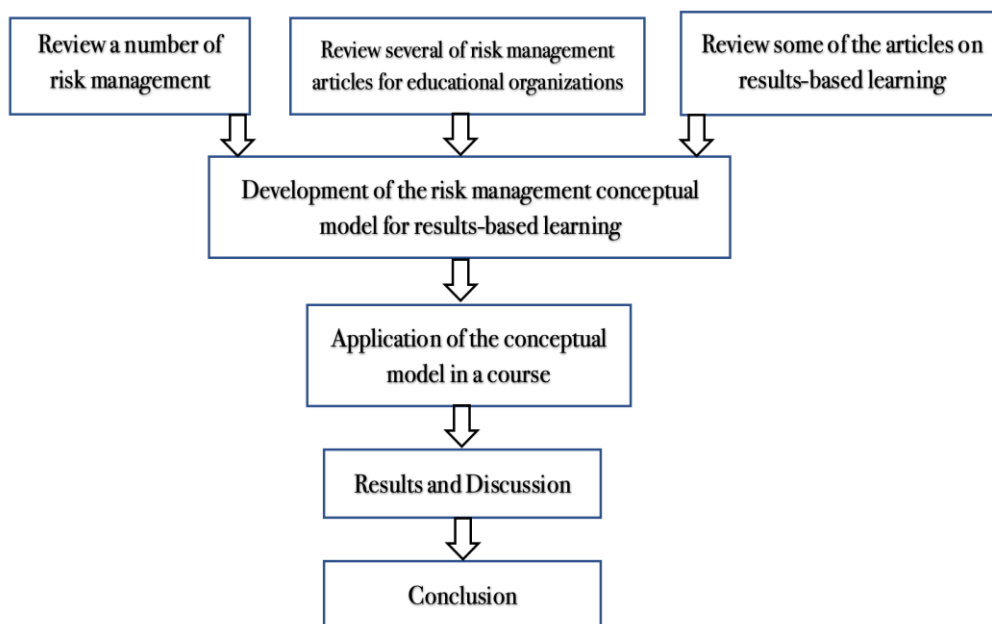

Figure 1. Research steps

The research steps for developing a risk management conceptual model for results-based learning (Figure 1) are described as follows. The first step is to review several articles related to risk management, risk management in educational organizations, and results-based learning. A review of some articles has been carried out in the Introduction section to provide context for this research and to differentiate it from previous risk management studies. In the second step, the results of reviewing many related articles, we developed a risk management conceptual model for results-based learning (Figure 2), with examples of application in a course. In the next step, we report the results of this research in the form of implementing risk management in a course, measuring course learning outcomes and graduate learning

outcomes, and conducting discussions regarding these results. Finally, we draw conclusions that include theoretical and practical contributions and suggestions for future research.

RESULTS

Development of a Risk Management Conceptual Model for Outcome-Based Learning

The development of this conceptual model (Figure 2), the study program begins by establishing a scientific vision. Based on the scientific vision, the study program sets the educational goals of the study program and formulates a graduate profile. Furthermore, the study program determines Graduate Learning Outcomes (GLO) from this graduate profile. From the determination of this GLO, study programs design and develop curricula under laws and regulations and the requirements of interested parties. All courses in the curriculum must refer to GLO. Then, for each course, a Semester Learning Plan (SLP) must be prepared, which contains Course Learning Outcomes (CLO) in the form of essential competencies that course participants must master. CLO must be linked to GLO. So that the GLO and CLO are achieved, the teaching staff arranges risk management (Plan stage). After the teaching team carries out the learning process (Do stage) and carries out risk control, then the teaching team measures GLO and CLO for course participants (Check stage). Based on the results of the GLO and CLO measurements, the teaching team conducts analysis and evaluation to improve results-based learning performance, including, whenever possible, revising the SLP periodically according to the dynamics of science and technology development (Act stage).
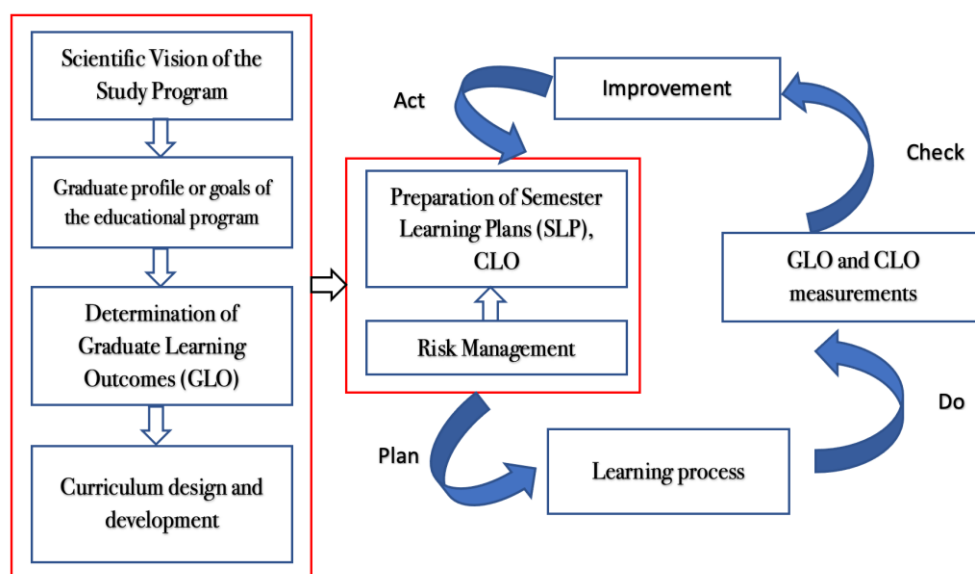

Figure 2. Risk management conceptual model for results-based learning

Furthermore, although the following example of applying the risk management conceptual model for results-based learning is limited to one subject, teaching staff in other subjects can apply this conceptual model.

Example of Application in a Course

This paper discusses examples of the application of risk management for results-based learning in one concentration course in the Industrial Engineering Study Program Surabaya University, namely the Integrated Management System (IMS) course. This three credits course focuses on creating competency for course participants in integrating various management system standards issued by ISO, such as ISO 9001, ISO 14001, ISO 45001, etc. The integration methodology uses the British PAS 99 standard approach.

a. GLO assigned to this course are:

- GLO 16: Able to recognize needs and manage lifelong self-learning based on a spirit of independence, innovative and entrepreneurial spirit, and

- GLO 17a: Able to apply and develop industrial engineering principles in enterprise systems (intra-company systems) to create superior business processes by utilizing data, technology, and human literacy through an integrated approach between environmental, economic, and community aspects (sustainable development).

While CLO and its relationship with GLO are as follows:

- CLO1. Able to understand the requirements of management system standards such as ISO 9001, ISO 14001, and ISO 45001 used in the manufacturing industry. CLO1 is connected to GLO 16,

- CLO2. Able to design and implement integrated management system standards based on BS PAS 99 standards in the manufacturing industry. CLO2 is connected to GLO 17a,

- CLO3. Able to evaluate the effectiveness of an integrated management system standard based on the BS PAS 99 standard in the manufacturing industry. CLO3 is connected to GLO 17a.

Furthermore, Table 1 provides the types of ratings and weights of each CLO and GLO.

Table 1. Types of assessments and weights for each CLO and GLO for IMS subjects

Assessment	CLO1 (%)	CLO2 (%)	CLO3 (%)	GLO 16 (%)	GLO 17a (%)
Task	6			6	
Project 1		14			14
MSE		20		10	10
Project 2			30		30
FSE		15	15		30
Sub total	6	49	45	16	84

In order to ensure that students' GLO and CLO are achieved, the teaching team, as the risk owner, makes risk management (Table 2) as follows.

Table 2. Risk management for IMS subjects in Odd Semester 2022/2023

Activities	Performance Indicator	Potential Problems	Impacts	Risk Assesment P	S	R	Evaluate the level of risk	Current Risk Control	Additional Risk Controls	Residual Risk P	S	R
Learning *Integrated Management System* courses	Minimum GLO achievement of 55%	Students have not fulfilled the GLO	Extend the duration of study	1	3	3	Light risk	College agreement with students	Not required, monitor for current risk control	1	3	3
	Minimum CLO achievement of 55%	Students have not met the CLO	Extend the duration of study	2	3	6	Moderate risk	Grant College contract agreement with students	Added case studies of organizations implementing IMS	1	3	3

Where,

• P: Chance (Probability) of the occurrence of events or events that cause problems, with a value of 1: Very rarely happens, 2: rarely, and 3: Often happens,

• S: Impact (Severity) is the level of impact of achievement or non-achievement of performance indicators, with a value of 1: Small impact, 2: Moderate impact, and 3: Big impact,

• R: Risk (Risk) multiples the P and S values. The range of R scores is 1 to 9,

• Risk Evaluation is divided into three levels, for scores R=1-3 (mild risk), R= 4-6 (moderate risk), R=7-9 (high risk)

• Current risk control, according to the evaluation of the risk level. The teaching staff monitors the current risk controls for a mild risk level. For moderate risk, the teaching staff performs current and additional risk controls. Additional risk control in the form of additional activities or work programs that can reduce the level of risk,

• Residual risk is the risk whose value is expected to decrease after the additional control has been implemented and is an inherent risk.

In Table 2, no additional controls are needed to achieve GLO because the risk evaluation is in the mild category. The teaching team is only conducting control at this time by monitoring the implementation of lecture contracts and SLP. Meanwhile, to ensure the achievement of CLO, because the risk evaluation is in the moderate category, it requires additional controls besides the current controls; namely, the teaching team adds case studies of organizations that implement IMS when delivering teaching. This one assists students in working on project assignments and answering questions about the Mid Semester Examination (MSE) and Final Semester Examination (FSE). This additional control makes it possible to reduce the level of moderate risk to mild risk.

b. The teaching team carries out the learning process by the SLP and considers risk control for achieving GLO and CLO. The teaching team delivered lessons using face-to-face meetings and discussions and discussed several case studies on implementing IMS in several companies. Meanwhile, course participants work on assignments and projects and make presentations related to internal audit findings from project work.

c. The teaching team conducted a learning assessment for 14 (fourteen) course participants through the measurement of each of their respective CLO and GLO (Table 3) as follows. The teaching staff measures CLO according to the type of assessment, whether through the work results on assignments, projects, or MSE and FSE. From the results of this measurement, the teaching staff decides which course participants pass or fail.

Table 3. Measurement of student CLO and GLO for IMS Courses in Odd Semester 2022/2023

Student	CLO1 (%)	CLO2 (%)	CLO3 (%)	GLO 16 (%)	GLO 17a (%)	P/F *
1	0	43	74	28	74	P
2	85	68	77	72	77	P
3	43	72	77	73	77	P
4	83	43	48	64	0	F
5	42	64	74	64	74	P
6	84	68	81	70	81	P
7	85	67	74	75	74	P
8	85	68	77	73	77	P
9	42	69	81	63	81	P
10	85	74	82	78	82	P
11	0	68	76	62	76	P
12	85	73	81	77	81	P
13	85	67	82	69	82	P
14	84	67	80	68	80	P

* P: Pass, F : Fail

d. Corrective action to improve learning performance

The teaching team analyzed the results of these CLO and GLO measurements.

i. In the CLO measurement, five students who did not meet CLO1 participated in the course. Two of the five students did not submit individual assignments, and three needed to meet the assessment standards. Therefore, the five students needed help to fulfill CLO1. However, the CLO1 weight is only 6%, so students can still pursue competence through group assignments (projects 1 and 2) which have a greater weight. Furthermore, two students still need to fulfill CLO2. The two students got low scores on MSE and FSE, but the value for Project 1 was relatively high because the project assignments were carried out in groups. Whereas in CLO3, there was one student who scored below 55%. CLO3 consists of Project 2 and FSE assessments. The student did not participate in the FSE, which caused the CLO3 score not to be achieved,

ii.   In the GLO measurement, one student scored a GLO 16, and one scored a GLO 17a <55%. Because the GLO 16 weight for courses is only 6%, the student can still pass (L); however, for GLO 17a, it weighs 94%, and students who get a GLO 17a score <55% are declared not passed (F), and

iii. The teaching team took corrective action related to this discrepancy in the following semester at the beginning of the lecture, asking for commitments from all students participating in the course to comply with the agreed lecture contract.

DISCUSSION

The results-based learning approach is completely learner-centered, focusing on what students know and can do. Within the scope of delivering course learning, to ensure the achievement of GLO and CLO, the teaching team needs to manage risk by making several controls in implementing learning, especially on CLO. Students must master this essential competency.

IMS course participants can fulfill essential competencies through assignments 1, UTS, project 2, and UAS. To ensure that students can achieve the essential competencies of the course, the teaching team carries out risk control by adding examples of case studies of organizations implementing IMS, especially in the section on integrating ISO management system documents. Furthermore, the course participants worked in groups to study two journal articles on the application of IMS in companies, worked on Project 1 in the form of designing and documenting IMS in the company they chose as a case, and Project 2 in the form of carrying out desk audit simulations from IMS documents from other groups. In addition, students work on UTS and UAS as individual assessments to complete the assessment of assignments, project 1 and project 2.

As a result of the learning implementation, the teaching team measured the GLO and CLO participants to measure the performance to be achieved. The measurement results show that a one-course participant does not pass because CLO2 and CLO3 are not fulfilled and have high weights. After being traced, the cause of the non-graduation of the course participants was that they did not participate in the UAS. In contrast, The UAS weight of 50% contributed to CLO's unachieved.

Furthermore, the course teaching team takes corrective action in the next semester by announcing the rules for obtaining grades to course participants from the start so that there is cooperation. It binds them to be more serious about preparing for and following this course. Mechanisms such as making risk management at the beginning of the semester (Plan stage), carrying out learning

(Do stage), measuring CLO and GLO (Check stage), and carrying out corrective actions (Act stage) are for continuous improvement of results-based learning performance in subsequent periods (Elahi & Ilyas, 2019; Redmond et al., 2008).

However, as is the learning of two parties, creating this competency requires the collaboration of both the teaching team and course participants. This conceptual model with examples of risk management in this results-based learning complements those related to previous risk management, such as risk management for achieving critical performance (Assmuth & Hilde, 2008; Chiarini, 2017, Tupa, Simota, & Steiner, 2017).

CONCLUSION

Study programs and teaching staff must carry out outcome-based learning risk management to ensure the success of the results-based learning objectives. Study programs and teaching staff must use the PDCA cycle to improve results-based learning performance. Furthermore, study programs that can manage results-based learning can obtain several recognitions from external parties, such as from graduate users who feel the competence of graduates is by their needs and expectations (Gunarathne et al., 2019). In addition, study programs that have the ability to produce student competencies through results-based learning will gain recognition from study program accreditation institutions at the national and international levels.

Contributions to Theory

Many works of literature still discuss risk management in the manufacturing sector. Even if there are educational organizations, they rarely discuss risk management in the learning process. This paper will complete the discussion of risk management in educational organizations, especially in results-based learning. The author developed a conceptual model of risk management of results-based learning aimed at guiding how teaching staff can ensure that the objectives of achieving GLO and CLO from results-based learning can be achieved systematically and that their performance is increased from time to time.

Practical Contribution

Study program leaders and teaching staff can use this conceptual model to answer the challenge can create graduate competencies according to the requirements of students and other beneficiaries through results-based learning. Success in implementing results-based learning can increase the assessment score of criterion 6 (Education Criteria) from National Accreditation Board for Higher

Education and Independent Accreditation Body. Meanwhile, in the creation of competencies, results-based learning is dynamic following developments in knowledge and technology, as well as the needs of graduate users. For this reason, to ensure uncertainty due to environmental changes, the study program should have developed risk management to deliver its educational services.

Limitations and Future Research

This paper only discusses outcome-based learning risk management in the learning process, which is the primary process of education service. For this reason, further research can be carried out on other business processes in an educational organization.

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REFERENCES

Arena, M., Arnaboldi, M., & Palermo, T. (2017). Accounting , Organizations and Society The dynamics of (dis) integrated risk management : A comparative fi eld study. *Accounting, Organizations and Society*, *62*, 65–81. https://doi.org/10.1016/j.aos.2017.08.006

Assmuth, T., & Hilde, M. (2008). The significance of information frameworks in integrated risk assessment and management. *Environmental s Cience & p Olicy*, *11*, 71–86. https://doi.org/10.1016/j.envsci.2007.07.006

Badan Standardisasi Nasional. (2019). *Sistem manajemen untuk organisasi pendidikan — Persyaratan dengan panduan penggunaan*.

Bucelli, M., Paltrinieri, N., & Landucci, G. (2018). Integrated risk assessment for oil and gas installations in sensitive areas. *Ocean Engineering*, *150*(January 2017), 377–390. https://doi.org/10.1016/j.oceaneng.2017.12.035

Chiarini, A. (2017). Risk-based thinking according to ISO 9001:2015 standard and the risk sources European manufacturing SMEs intend to manage. *TQM Journal*, *29*(2), 310–323. https://doi.org/10.1108/TQM-04-2016-0038

Dayananda, P., & Latte, M. V. (2021). New approach for target setting mechanism of course outcomes in higher education accreditation. *Journal of Economic and Administrative Sciences*, *37*(1), 79–89. https://doi.org/10.1108/jeas-03-2020-0024

Elahi, F., & Ilyas, M. (2019). Quality management principles and school quality: Testing moderation of professional certification of school principal in private schools of Pakistan. *TQM Journal*, *31*(4), 578–599. https://doi.org/10.1108/TQM-11-2018-0173

Gunarathne, N., Senaratne, S., & Senanayake, S. (2019). Outcome-based education in accounting. *Journal of Economic and Administrative Sciences*, *36*(1), 16–37. https://doi.org/10.1108/jeas-08-2018-0093

ISO. (2015). Standar Internasional ISO 9001:2015 Sistem Manajemen Mutu - Persyaratan. In *Jurnal Sipil Statik*.

Le Fur, E., & Outreville, J. F. (2022). Financial literacy, education and risk aversion: a survey of French students. *Managerial Finance*, *48*(9–10), 1530–1543. https://doi.org/10.1108/MF-10-2021-0509

MacKenzie Jr, W. I., Scherer, R. F., Wilkinson, T. J., & Solomon, N. A. (2019). A systematic review of AACSB International accreditation quality and value research. *Journal of Economic and Administrative Sciences*, *36*(1), 1–15. https://doi.org/10.1108/jeas-10-2018-0123

Marx, J., & de Swardt, C. J. (2023). An interactive qualitative analysis of academics' views of a competency-based undergraduate qualification in risk management. *Qualitative Research in Financial Markets*, *15*(3), 471–494. https://doi.org/10.1108/QRFM-03-2022-0039

Miller, K. D., & Waller, H. G. (2003). Scenarios , Real Options and Integrated Risk Management. *Long Range Planning*, *36*, 93–107. https://doi.org/10.1016/S0024-6301(02)00205-4

Nuraisyah, S., Harahap, RD., Harahap, Darul (2021). Analysis of Internet Media use of Student Biology Learning Interest During Covid-19. Jurnal Penelitian Pendidikan IPA. DOI: 10.29303/jppipa.v7i2.624

Redmond, R., Curtis, E., Noone, T., & Keenan, P. (2008). Quality in higher education: The contribution of Edward Deming's principles. *International Journal of Educational Management*, *22*(5), 432–441. https://doi.org/10.1108/09513540810883168

Tupa, J., Simota, J., & Steiner, F. (2017). Aspects of risk management implementation for Industry 4 . 0. *Procedia Manufacturing*, *11*(June), 1223–1230. https://doi.org/10.1016/j.promfg.2017.07.248

Vorst, C. R., Priyarsono, D. S., & Budiman, A. (2018). Manajemen Risiko Berbasis SNI ISO 31000. In *Badan Standarisasi Nasional* (Vol. 13, Issue 1).