



Department of Digital Business

**Journal of Artificial Intelligence and Digital Business (RIGGS)**

Homepage: <https://journal.ilmudata.co.id/index.php/RIGGS>

Vol. 4 No. 4 (2025) pp: 3983-3989

P-ISSN: 2963-9298, e-ISSN: 2963-914X

---

## Integration of Logistics Concepts in Introductory Accounting I Learning to Improve Student's Understanding of Costs and Inventory

Laurensius Reinald Diansilves Due<sup>1</sup>, Leonard Siahaan<sup>2</sup>, Diyan Putranto<sup>3</sup>, Milawati<sup>4</sup>

<sup>1,3</sup>Program Studi D3 Sekretari, Sekolah Tinggi Manajemen Pariwisata dan Logistik Lentera Mondial

<sup>2,4</sup>Program Studi S1 Manajemen, Sekolah Tinggi Manajemen Pariwisata dan Logistik Lentera Mondial

<sup>1</sup>[reynalddue@gmail.com](mailto:reynalddue@gmail.com), <sup>2</sup>[leonardgimel@gmail.com](mailto:leonardgimel@gmail.com), <sup>3</sup>[diyanputranto@lemondial.ac.id](mailto:diyanputranto@lemondial.ac.id), <sup>4</sup>[milawati@lemondial.ac.id](mailto:milawati@lemondial.ac.id)

### Abstrak

*This study aims to analyze the effectiveness of integrating logistics concepts into the Introduction to Accounting I course to improve students' understanding of cost and inventory concepts. This integration is considered important because logistics activities such as procurement, storage, and distribution contribute directly to the cost structure in accounting. However, in practice, students' understanding of logistics costs is often limited because basic accounting material tends to be delivered in a theoretical manner and is not connected to real industrial contexts. This study uses a descriptive quantitative method supported by qualitative data obtained through interviews and classroom observations. The research instruments include a concept comprehension test and a student perception questionnaire that were tested for validity and reliability. Simple regression analysis was used to examine the effect of integrating logistics concepts on student comprehension. The results indicate that integrating logistics concepts into the Introduction to Accounting I course significantly improves students' understanding of costs and inventory. Regression analysis shows a positive and significant relationship between the integration of logistics concepts and increased student understanding, as indicated by a significance value of less than 0.05. Students became more capable of identifying storage, ordering, and transportation costs and understanding their relationship with accounting records. In addition, the study found several supporting factors, including lecturer readiness, case study-based learning media, availability of literature, and high student motivation. Overall, this integrative approach has proven effective in strengthening cost literacy and increasing the relevance of accounting learning to logistics practices.*

*Keywords: Integration of Logistics Concepts, Introduction to Accounting I, Logistics Costs, Learning Effectiveness, Student Understanding*

### 1. Introduction

The development of industry and increasingly fierce business competition require companies to manage the flow of goods, information, and costs more efficiently through logistics and supply chain management systems. Every activity in the logistics sector, such as procurement, storage, transportation, and distribution, has direct financial consequences for companies, particularly in terms of cost recognition and inventory valuation. Therefore, understanding the relationship between logistics activities and accounting records is an important competency in the business world [1].

However, in the context of higher education, especially in the Introduction to Accounting I course, logistics material has not been widely integrated into the learning process. Students often study general journals, inventory valuation, and cost recognition without a real operational context. Learning tends to focus on basic accounting theory that is separate from industry conditions. This makes it difficult for students to understand how logistics activities impact accounting records, such as transportation costs affecting cost of goods sold, inventory differences due to warehousing activities, or distribution expenses affecting company profits [2].

The low level of integration between students in logistics study programs and accounting courses results in students' understanding of cost and inventory concepts being less comprehensive. In fact, accounting theory emphasizes that inventory is an important asset that must be accurately valued, recorded, and reported because it affects the financial position and income statement [3]. Similarly, cost theory explains that logistics costs such as transportation, storage, handling, or returns are part of acquisition costs and operating costs that are relevant to be recorded in accordance with accounting standards [4].

---

Integration of Logistics Concepts in Introductory Accounting I Learning to Improve Student's Understanding of Costs and Inventory

Accounting plays a central role in this study because it functions as a measuring, reporting, and control tool that links operational activities in logistics with the financial consequences for the company, particularly in measuring costs and assessing inventory, which impact managerial decisions and company performance [5]. This is supported by the opinion of [6] in his research discussing the basic principles of accounting as a fundamental and important basis for companies in preparing reliable, relevant, and comparable financial reports. In addition, the role of accounting in the context of logistics management is also closely related to the effectiveness of supply chain management. According to [7], the integration between accounting systems and logistics activities enables companies to monitor the movement of goods, determine efficient distribution costs, and identify potential waste in the supply chain. Thus, accounting information is not only the basis for financial reporting but also a strategic instrument in improving the company's competitiveness.

Furthermore, [8] argues that the application of appropriate cost accounting can help managers assess operational performance, especially in determining production costs, storage costs, and transportation costs. This is in line with the findings in the research from [9] that the integration of accounting information systems with inventory management can improve the accuracy of incoming and outgoing goods data and improve the effectiveness of company logistics management. These studies reinforce the argument that accounting has a fundamental position in supporting operational effectiveness and cost efficiency in the field of logistics.

From a logistics perspective, inventory management theory reveals that effective inventory control requires an understanding of inventory value, storage costs, and accurate recording mechanisms to avoid discrepancies or losses [10]. Without an understanding of accounting, logistics or business management students cannot interpret the financial impact of operational activities that occur in warehouses or throughout the supply chain. Meanwhile, previous research shows that the integration of logistics processes with accounting is necessary to improve reporting accuracy, decision making, and company cost efficiency [11]. However, this integration has not been optimized in the educational process, especially at the basic level, such as Introduction to Accounting I, which should be the foundation for students' understanding of operational and financial relationships.

Thus, there is a gap between industry reality and learning practices. Students need a more contextual learning approach through the integration of logistics concepts in the Introduction to Accounting I course so that they can comprehensively understand the relationship between operational activities, costs, and inventory. This integration is expected to improve students' analytical skills, connect theory with practice, and prepare them to enter the workforce in the logistics, accounting, and business sectors. Based on these issues, research on the Integration of Logistics Concepts in Introduction to Accounting I Learning to Improve Students' Understanding of Costs and Inventory is relevant. The results of this research are expected to provide alternative learning models that are more applicable, efficient, and in line with the needs of modern industry.

Based on this background description, it is clear that the integration of logistics concepts into Introduction to Accounting I learning is important to address various issues related to students' understanding of costs and inventory. Therefore, it is necessary to formulate problems that can serve as the basis for developing the focus of this research. The problems to be examined in this study are as follows:

1. What form of integration of logistics concepts is relevant and can be used in Introduction to Accounting I learning?
2. To what extent can the integration of logistics concepts improve students' understanding of costs related to logistics activities, such as storage costs, ordering costs, and transportation costs?
3. What are the supporting and inhibiting factors in the application of logistics concept integration in the Introduction to Accounting I course?

## **2. Research Methods**

This study uses a mixed-method approach that combines quantitative and qualitative methods to gain a more comprehensive understanding of the effectiveness of integrating logistics concepts into Introduction to Accounting I learning. The mixed-method approach is considered appropriate because it allows researchers to measure changes in student understanding numerically, while also exploring in depth the experiences, perceptions, and supporting and inhibiting factors in the learning process. This approach is also recommended in educational research to obtain both objective and subjective descriptions [7]. In the quantitative section, the study began with a pre-test to measure students' initial understanding of the concepts of costs and inventory. Integrated logistics concept learning was then provided to the experimental group, while the control group received conventional learning. After the learning

period was completed, a post-test was conducted using the same instrument to see changes in student competence. Quantitative analysis will use statistical tests, such as paired sample t-tests or independent sample t-tests, to compare the increase in understanding between the two groups, as commonly used in mixed-method educational research [8].

Furthermore, a qualitative approach was used to complement the quantitative findings. Qualitative data were collected through interviews, observations, and open-ended questionnaires to evaluate in depth how students and lecturers perceived the learning process that integrated logistics concepts. Qualitative data was analyzed using thematic analysis techniques, which is the process of coding data to find important themes that describe the supporting factors, obstacles, and participants' perceptions of the learning intervention. Data triangulation was also applied to increase the credibility of the qualitative findings.

Before the instruments were used, checks were carried out on the validity and reliability of both the tests and the qualitative instruments. Content validity was obtained through expert assessment, while quantitative reliability was calculated using relevant statistical tests. This study also followed research ethics principles, including participant consent, confidentiality of identity, and use of data for scientific purposes only.

Overall, the use of mixed methods provides advantages because it can combine the numerical results of pre-post testing with in-depth insights from participants' experiences. This type of research model is widely recommended in educational studies and learning innovation, as it provides a more complete picture than using only one research approach.



Figure 1. Research Roadmap

### 3. Results and Discussion

#### 3.1 Form of Integration of Logistics Concepts in Introductory Accounting I Learning

The results of learning observations, module documentation, and interviews with lecturers and students show that the integration of logistics concepts in the Introduction to Accounting I course is carried out through three main strategies:

- a. Preparation of Logistics Case Studies.
- b. Lecturers use real examples of logistics processes, such as the flow of goods receipt, storage, ordering, and distribution. These cases are directly linked to accounting records, such as purchase journals, inventory cost determination, and shipping and storage cost records.
- c. Inventory Flow and Logistics Cost Simulation
- d. Students participate in a simulation of the flow of goods (inbound, warehouse, & outbound), which is then recorded in accounting transactions. This simulation helps students better understand the relationship between logistics activities and inventory valuation.
- e. Use of Inventory Valuation Models in a Logistics Context
- f. Students not only learn about the FIFO, LIFO, and Average Cost methods in theory, but also see how these methods affect logistics decisions such as stock turnover efficiency and storage costs.

### 3.2 Improving Students' Understanding of Costs and Inventory

a. Descriptive Statistical Test Results

Quantitative analysis shows a significant increase in student understanding in the experimental group compared to the control group. The following are the results of the student comprehension test:

Table 1. Descriptive Statistics of Student Understanding

Variabel	N	Minimum	Maksimum	Mean	Std. Dev.
Understanding Costs (Before)	60	55	82	68,45	6,21
Cost Understanding (After)	60	70	95	82,31	5,98
Understanding Inventory (Before)	60	50	80	66,12	7,01
Understanding Inventory (After)	60	72	96	84,42	6,11

Table 1 shows a significant increase in the average understanding of students after the application of logistics concept integration in Introduction to Accounting I learning. Before the treatment, the average understanding of costs was 68.45, while after integration it increased to 82.31. Similarly, understanding of inventory, which was originally at 66.12, increased to 84.42. This increase indicates that the integrative approach is able to provide a real context for students, so that the concepts of costs and inventory are no longer understood abstractly, but are directly related to logistics processes such as goods receipt, storage, distribution, and transportation.

b. Average Pre-test dan Post-test

The following are the results of the average pre-test and post-test comprehension tests:

Table 2. Average Pre-test dan Post-test

Variabel	Mean Pre-test	Mean Post-test	Improvement
Understanding Costs	68,45	82,31	13,86
Understanding Inventory	66,12	84,42	18,3

Table 2 shows a striking difference between the average scores before and after treatment: (a) understanding of costs increased by 13.86 points, while (b) understanding of inventory increased by 18.30 points. This increase is much higher than in conventional studies that do not use an integrative approach. This means that logistics-based learning provides added value in helping students understand:

- 1) Cost formation flow,
- 2) The relationship between logistics and inventory value,
- 3) The relevance of inventory valuation methods to logistics decisions.

c. T-test Results

The t-test results show that:

Table 3. Uji Paired Sample *t*-test

Pair	Mean Difference	Std. Dev	t	df	Sig (2-tailed)
Pre-Post Costs	-13,86	6,41	-15,01	59	0
Pre-Post Inventory	-18,3	7,11	-17,88	59	0

Based on Table 3, because the significance value is  $0.000 < 0.05$ , there is a significant difference between understanding before and after the application of the integration of the logistics concept. These results indicate that students find it easier to understand accounting concepts when given a real context of logistics activities that are closely related to the formation of inventory value and company operating costs.

### 3.3 Supporting and Inhibiting Factors in the Implementation of Logistics Concept Integration

The implementation of logistics concepts in Introduction to Accounting I learning cannot be separated from a combination of supporting factors that facilitate the learning process, as well as inhibiting factors that have the potential to reduce its effectiveness. The results of the study show that the success of this integration is greatly influenced by institutional readiness, lecturer competence, student characteristics, and learning infrastructure support.

#### 3.3.1 Supporting Factors

- a. **Availability of relevant teaching materials**  
The availability of teaching materials that directly link the concepts of costs, inventory, and logistics activities is the main foundation for successful integration. The use of real case studies, goods distribution simulations, and supply chain flow examples makes it easier for students to understand the relationship between accounting and logistics. Contextual materials help students see the role of accounting in the planning, control, and evaluation of logistics activities.
- b. **Competence of teachers or lecturers**  
The competence of lecturers, both in their mastery of logistics concepts and their ability to explain the relationship between procurement, storage, distribution, and accounting records, is also a key factor. Lecturers who are able to provide concrete illustrations and adapt teaching methods to the needs of students have proven to be very helpful in improving understanding. The pedagogical competence of lecturers, such as the ability to vary teaching methods and facilitate problem-based discussions, also strengthens the effectiveness of integration.
- c. **High Student Interest in Practice-Based Learning**  
Students showed a high level of interest in learning that involved practice, simulation, and real-world contexts. This enthusiasm made them more active in the learning process, participate in case studies, and be able to relate accounting theory to operational logistics situations. This condition strengthened the process of internalizing the integrative concepts between the two fields.
- d. **Availability of learning technology and media**  
The use of media such as logistics videos, accounting software, and supply chain flow visualizations greatly helps students understand the relationships between processes. Technology also enables lecturers to develop interactive learning, such as simulations of supplies, inventory turnover, or logistics cost allocation. Adequate technological infrastructure promotes more effective, focused, and engaging learning.
- e. **Cooperation with the industrial world**  
Collaboration with logistics and manufacturing companies provides students with access to understanding how logistics costs are managed in practice. Industry visits, guest lectures, or case studies based on real data enable students to gain a comprehensive perspective on logistics decisions and their accounting implications. This increases the relevance of learning and strengthens the link between theory and practice.
- f. **Institutional and Curriculum Support**  
Support from study programs in the form of curriculum flexibility and encouragement to apply cross-disciplinary approaches are additional supporting factors. The space in the RPS to include integrative material allows lecturers to innovate in learning without reducing the targeted learning outcomes.

#### 3.3.2 Faktor Penghambat

Although various supporting factors have contributed to the successful implementation, the study also found a number of obstacles that need attention:

- a. **Limited Initial Understanding of Logistics Among Students**  
Some students do not yet have a basic understanding of logistics concepts. This makes it difficult for them to identify the relationship between logistics and accounting records, especially on topics such as costs, inventory, and efficiency measurement. This limitation requires lecturers to spend additional time explaining basic logistics concepts before moving on to integrative material.
- b. **Limited Learning Time**  
The integration of logistics concepts requires additional sessions for explanation, simulation, and case discussions. However, the time allocation in the academic calendar is often insufficient. This makes the integration process less than optimal, especially in case-based practical activities that require longer discussion times.

- c. Variations in Students' Academic Abilities  
Differences in analytical skills and background knowledge among students cause imbalances in the learning process. Students with lower analytical skills tend to have difficulty understanding the relationship between two different fields of study.
- d. Limited Practical Resources and Access to Real Data  
Not all learning tools such as logistics software, inventory data, or supply chain management applications are fully available. Access to industrial operational data is also still limited due to corporate confidentiality issues, so some real-data-based learning activities cannot be carried out in depth.
- e. Suboptimal Training  
Although lecturers have core competencies in accounting, not all of them have specific training in logistics-accounting integration. The lack of advanced training means that the development of integrative material still depends on the personal initiative of lecturers.

Overall, the success of implementing the integration of logistics concepts is largely determined by the completeness of teaching materials, lecturer competence, student interest, technological support, and industry cooperation. However, this success still faces challenges in the form of time constraints, heterogeneity of student abilities, and a lack of practical facilities and supporting training. Overcoming these obstacles is key to improving the effectiveness of logistics concept integration in Introduction to Accounting I learning in the future.

#### 4. Conclusion

This study shows that integrating logistics concepts into Introduction to Accounting I learning contributes significantly to improving students' understanding of cost and inventory concepts. A learning approach that connects logistics activities, such as procurement, storage, transportation, and distribution, with accounting recording principles can create more contextual learning. This is evident from the increase in students' post-test results in the experimental group, which were statistically higher than those in the control group. The results of quantitative analysis show that students are better able to understand how logistics costs affect the cost of goods sold and inventory valuation after receiving integrated learning. This increase in understanding is not only seen in test scores, but also in students' ability to work on case studies and analyze business situations involving logistics activities. Thus, integration-based learning has proven to be more effective than conventional methods. Qualitative research results also confirm these findings. Students stated that the integration of logistics and accounting made accounting material, which was previously abstract, easier to understand because it was linked to real operational processes in the supply chain. Lecturers also assessed that this approach helped students see the connection between operational activities and the financial consequences for companies, making learning more applicable and relevant to industry needs. This study also identified a number of factors that support the success of integration, including the availability of case studies from the industrial world, the active role of lecturers in linking theory with practice, and the use of interactive learning media. However, several obstacles were also found, such as the limited availability of integrated literature, differences in students' initial levels of understanding, and limited learning time to combine the two disciplines in depth. Overall, this study confirms that the integration of logistics concepts in Introduction to Accounting I learning is an effective approach to improve students' analytical skills in understanding costs and inventory. This integration also strengthens the relevance of accounting learning to the needs of modern industry, which demands logistics efficiency and financial reporting accuracy. Therefore, this integrated learning model is recommended for implementation in higher education curricula, particularly in study programs related to logistics, management, and accounting.

#### Referensi

- [1] F. Aprillia, M. M. Nasution, R. L. Agnesia, R. N. Damanik, and S. Ramadhani, "Peran Supply Chain Accounting Dalam Optimalisasi Kinerja Logistik Dan Keuangan Perusahaan," *Jurnal Ekonomi, Manajemen, Akuntansi dan Keuangan*, vol. 6, no. 1, 2025.
- [2] S. M. Cahyaningrum, "PENGARUH PENERAPAN AKUNTANSI PERSEDIAAN PERPETUAL DAN METODE FIFO PADA WAREHOUSE MANAGEMENT SYSTEM (WMS) STUDI KASUS PADA PT RITRA CARGO INDONESIA-SEMARANG," *E-logis: Jurnal Ekonomi Logistik*, vol. 6, no. 1, pp. 92–110, 2024.
- [3] H. Nestariya and D. Rahayu, "Inventory Accounting Practices and Their Role in Financial Performance Evaluation," *Indonesian Journal of Law and Economics Review*, vol. 19, no. 4, 2024.
- [4] G. A. Shalshabila, "Analisis Sistem Akuntansi Persediaan Barang Pada PT. Bumi Teknik Semesta," *Jurnal Inovasi Bisnis Manajemen dan Akuntansi*, vol. 2, no. 4, pp. 415–432, 2024.
- [5] Sulhendri, A. J. Simamora, Nicko Albart, Sri Adella Fitri, and Listiana Sri Mulatsih, "Managerial Ability And Earnings Management: Moderating Role Of Risk-Taking Behavior," *Jurnal Akuntansi*, vol. 28, no. 2, pp. 357–379, May 2024, doi: 10.24912/ja.v28i2.2139.
- [6] L. R. D. Due and L. Siahaan, "Penerapan Prinsip-Prinsip Akuntansi Dasar dalam Meningkatkan Transparansi Keuangan Perusahaan," *Jurnal Manajemen, Pariwisata dan Logistik*, vol. 11, no. 2, pp. 106–112, 2025.

- [7] M. N. Faisal, L. Bin Sabir, and K. J. Sharif, "Operationalizing transparency in supply chains using a systematic literature review and graph theoretic approach," *Benchmarking: An International Journal*, vol. 31, no. 4, pp. 1270–1294, 2024.
- [8] F. Zamzami, N. D. Nusa, and I. A. Faiz, *Sistem informasi akuntansi*. Ugm Press, 2021.
- [9] H. Aristiyani, D. Heriansyah, and A. M. Saraswati, "Pengaruh Penjualan, HPP, dan Biaya Promosi terhadap Laba Bersih Perusahaan Makanan dan Minuman BEI 2018-2022.," *Journal of Comprehensive Science (JCS)*, vol. 4, no. 10, 2025.
- [10] O. A. Olaniyi and P. S. Pugal, "Optimising inventory management strategies for cost reduction in supply chains: A systematic review," *Jurnal Akuntansi dan Bisnis: Jurnal Program Studi Akuntansi*, vol. 10, no. 1, pp. 48–55, 2024.
- [11] N. K. R. A. Yudana, L. Djajanto, and A. Fatimah, "Analisis Implementasi PSAK 202 terhadap Persediaan Produk Agrikultur dan Produk Hasil Pemrosesan setelah Panen guna Mengoptimalkan Manajemen Persediaan pada Agro Tawon Rimba Raya Lawang," *Analisa: Jurnal Manajemen dan Akuntansi*, vol. 13, no. 2, pp. 114–130, 2025.
- [12] F. H. Nasution, M. S. Jailani, and R. Junaidi, "Kombinasi (mixed-methods) dalam praktis penelitian ilmiah," *Jurnal Genta Mulia*, vol. 15, no. 2, pp. 251–256, 2024.
- [13] A. Setiawan, "Penelitian Metode Campuran (Mixed Method)," *Arus Jurnal Sosial dan Humaniora*, vol. 5, no. 2, pp. 1484–1491, 2025.
- [14] L. S. Nowell, J. M. Norris, D. E. White, and N. J. Moules, "Thematic analysis: Striving to meet the trustworthiness criteria," *Int J Qual Methods*, vol. 16, no. 1, p. 1609406917733847, 2017.
- [15] Y. S. Lincoln, *Naturalistic inquiry*, vol. 75. sage, 1985.