

Methods of Estimating Inventories Training for SMA Kristen Yusuf Students

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Abstract

The partner in this community services (PKM) is SMA Kristen Yusuf. This school was chosen because it has a conducive learning environment and good support from the school for academic activities outside of school hours. Every year, the Partner always screens and prepares outstanding students to participate in accounting competitions held by various national-level universities. Therefore, the problem currently being experienced by the Partner is that the Partner needs additional accounting materials for the purposes of the competition, including inventory valuation using the estimation method. The training activity was held face-to-face (onsite) on Thursday, September 25, 2025, from 3:05 PM to 4:40 PM WIB, attended by 4 students from grades 12 and 11. The training was orderly, focused, and interactive. Participants enthusiastically answered questions posed by the PKM team. Based on questionnaire results, most students expressed satisfaction with the training. They felt the material was delivered in an easy-to-understand manner, the classroom atmosphere was pleasant, and the instructor was able to explain concepts clearly. Several students also stated that the training made them more interested in learning accounting basics independently. There are three outputs from this training: Publication Articles, Intellectual Property Rights (IPR), and Products/Prototypes.

Keywords: Accounting, Inventory, Gross Profit, Retail Method.

1. Introduction

Inventory is one of the valuable assets owned by a company to be sold to consumers in order to gain profit in the form of money or other means of exchange (Sadeli, 2018). There are differences in the types of inventories found in trading companies and manufacturing companies. Inventory in trading companies includes finished goods previously purchased from suppliers to then be sold to consumers without the company having to further produce or change the structure or form of these goods to obtain profit in the form of money. Thus, in trading companies, unsold goods will be recorded as current assets. The value of merchandise inventory can consist of several costs related to the purchase transaction of that inventory, including transportation costs, insurance costs, and other costs. Meanwhile, for manufacturing companies, inventory is divided into 3 types, namely: raw material inventory, work-in-process inventory, and finished goods inventory (Sofia et al., 2018). This type of company purchases raw materials from suppliers then produces them further into finished goods (ready-to-sell goods) which are then marketed and sold to consumers.

In recording inventory, companies can choose recording methods according to company needs. There are two types of recording: the Perpetual recording method and the Periodic method (Kimmel et al., 2020). In the Perpetual Recording system, every time a sale or purchase occurs, it will affect the inventory account, so the remaining inventory value can



always be known. Nevertheless, counting the physical quantity of inventory at the end of the period is still needed to check the accuracy of inventory recording and determine damaged or lost inventory. Meanwhile, in the Periodic Recording system, counting the physical quantity of inventory at the end of the period is needed to determine the inventory that still exists at the end of the period and determine the cost of goods sold during that period (Yuniarwati et al., 2018). Counting physical inventory is done by counting, weighing, or measuring each inventory (Kieso et al., 2020). In companies that have thousands of inventory items, physical inventory counting is usually done at business closing time or when activities are slow or at the end of the accounting period, in order to produce more accurate counts. There are several methods for calculating inventory cost, for example with the Cost Flow Assumption method, namely: a) FIFO and b) Average.

The FIFO method assumes that goods or inventory units that are purchased or produced (manufactured) first will be the goods that are sold first or used in the production process. This method is often considered the most logical because it approaches the physical movement flow of goods in most industries, especially goods that have expiration dates or experience quality degradation over time, such as food, beverage, and pharmaceutical products. The Average method uses calculation of the average price of all available inventory during a certain period. Average calculation can be done perpetually (moving average) or periodically (weighted average), depending on the inventory recording system used. This concept combines all inventory purchase costs, then divides them by the number of available inventory units, so that each unit has the same value (Kieso et al., 2020; Warren et al., 2019).

In practice, not all companies can conduct physical inventory valuation at all times because the company is experiencing obstacles that make physical valuation very difficult to implement. Companies will estimate inventory in situations: (1) need for interim reports, (2) urgent conditions such as fire, flood, or mass theft so that physical counting becomes impossible, (4) time and cost efficiency, for large businesses, counting all physical inventory outside the official schedule can be time-consuming and costly, or (4) internal monitoring where management often needs quick estimates of inventory value to control purchases, determine selling prices, or measure inventory turnover rates.

Inventory estimation itself is divided into two methods, namely the Gross profit method and the Retail Method (Yuniarwati et al., 2018). The Gross Profit Method is an inventory estimation method based on the historical relationship between sales and the company's gross profit. The basic principle is that if the gross profit percentage from sales is known and relatively stable, then COGS can be estimated. After COGS is obtained, ending inventory can be calculated. The formula for the gross profit method is (Kieso et al., 2020):

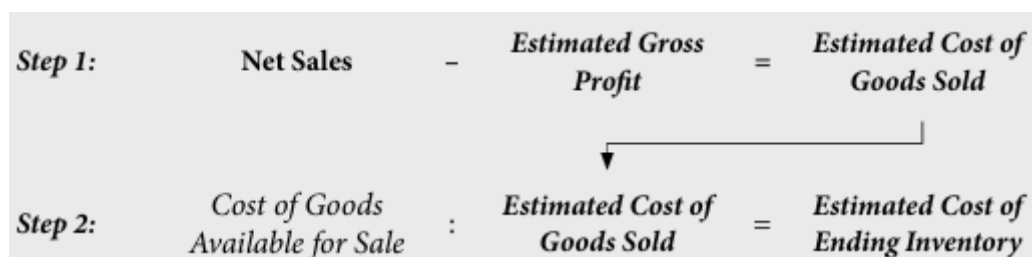


Figure 1. Gross Profit Method Formula

The Retail Method is an inventory estimation method that uses the comparison between the total cost of goods and the total retail selling price of those goods. This ratio will then be applied to the ending inventory value (usually at retail price) to convert it to cost price.

The Retail Method formula is (Warren et al., 2019):

Step 1:	<i>Cost of Goods Available for Sale at Retail</i>	-	<i>Net Sales</i>	=	<i>Ending Inventory at Retail</i>
Step 2:	<i>Goods Available for Sale at Cost</i>	:	<i>Goods Available for Sale at Retail</i>	=	<i>Cost to Retail Ratio</i>
Step 3:	<i>Ending Inventory at Retail</i>	x	<i>Cost to Retail Ratio</i>	=	<i>Estimated Cost of Ending Inventory</i>

Figure 2. Retail Method Formula

The background of this PKM activity is based on awareness of the importance of education's role as a long-term investment for a country in developing capabilities and improving the quality of life of the Indonesian nation (Sariningsih et al., 2022). Related to this, SMA Kristen Yusuf strongly supports its students to obtain knowledge to the maximum and even achieve outside of school. Every year, the Partner always screens and prepares high-achieving students to be confident and willing to improve their hard skills and soft skills through accounting competitions held by various national-level higher education institutions. Proven, with thorough preparation, this school is able to win various competition events they participate in.

The problem currently experienced by the Partner is that the Partner needs additional in-depth accounting material that exceeds the existing school curriculum to prepare selected students to participate in accounting competitions. One of the accounting topics they want to provide to students is about inventory valuation using estimation methods, where this material should be obtained at the higher education level. As a solution to this problem, this training was held with an easy and interesting delivery method so that it is expected to improve student understanding when learning accounting material.

The primary objectives of this study are to introduce and explain the concepts of inventory estimation methods, specifically the gross profit method and the retail inventory method; and to enhance students' problem-solving skills by guiding them through practical exercises and competition-style questions.

Various empirical evidence has been obtained that through training activities held at high schools offline within the framework of basic accounting material literacy, it has provided a positive impact for Partners in improving students' ability to understand accounting more deeply (Adang et al., 2025; Imelda et al., 2025; Wirianata et al., 2024; Yanti et al., 2024). Furthermore, this PKM also supports the PKM roadmap and featured themes in the Master Plan for Research and PKM, namely Effective and Efficient Sustainable Business Management. This activity is expected to encourage SMA Kristen Yusuf students to be able to apply internal control principles in a business, especially regarding cash, and to be able to apply petty cash accounting when entering society or conducting entrepreneurial activities.

2. Methods

The following is an elaboration of the form/type of implementation method in this PKM. First, using a Theory-based approach. The PKM Team provides material explanations summarized in a training Module, namely: definition of inventory, types of inventory, accounting for inventory, inventory valuation methods, gross profit and retail methods. Students are invited to be interactive so that two-way discussion occurs. After the material is explained, it is continued by discussing practice questions about determining inventory value

using the gross profit and retail methods. At the end of the session, participants are given a quiz question as feedback. The following is a flow diagram of PKM Implementation Stages:

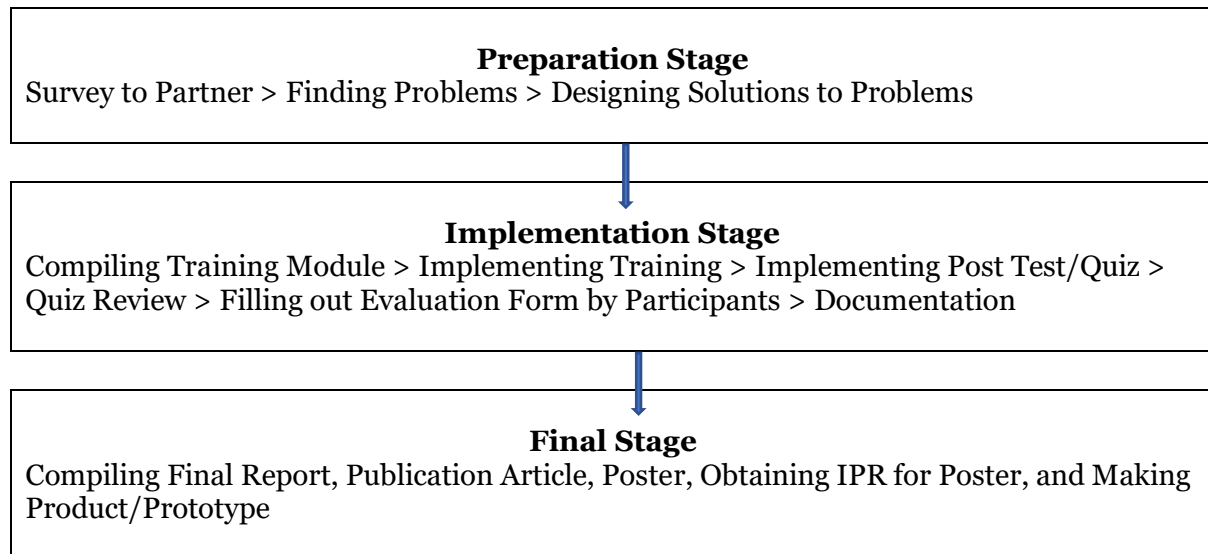


Figure 3. PKM Implementation Stages

3. Results and Discussion

According to the agreement between the school and the PKM Team, the training activity was carried out on Tuesday, February 11, 2024, starting from 3:00 PM to 4:40 PM WIB. The implementation team arrived at SMA Kristen Yusuf around 2:35 PM. Upon arrival at Kristen Yusuf school, the PKM Team was warmly welcomed by the school. Furthermore, the school escorted the team to the training room, namely the 2nd floor Classroom, which had been prepared beforehand. In addition, the school also prepared a participant attendance list.

While waiting for all training participants to enter the room, the PKM Team prepared various equipment to be used, such as stationery (pens, markers, and erasers), file folders, light refreshments. Activity participants were competition class students who had been selected by the school totaling 6 people, but 2 students were unable to attend so 4 people participated in the training. Before the session started, the PKM Team distributed training materials that had been photocopied to all participants. The training began with a brief introduction between the school and the PKM Team, then continued with the opening of the training event.



Figure 4. Training Preparation Situation

At 3:05 PM WIB, the first session began with the delivery of material about inventory. The delivery was done in a tutorial and interactive manner by the Lecturer referring to the training module that had been compiled previously. The material covered basic accounting introduction, trading accounting, and explanation of the concept of inventory estimation. Before entering the core discussion, participants were first invited to have a light discussion about accounting knowledge they had previously learned at school. From the question and answer results, it was known that most students did not yet understand much about inventory, because the economics lessons given only discussed service accounting and a little about trading accounting. Nevertheless, the first session proceeded with high enthusiasm. Participants listened to the explanation with focus, answered questions given, and some were even active in giving responses. The results of this session showed that the inventory material was successfully understood well by participants, in accordance with the activity objectives.



Figure 5. Situation During Training

Then, the second session continued with discussion about inventory estimation methods (Gross Profit and Retail) along with practice problem examples. In this session, participants were actively involved to discuss and solve problems together. The classroom atmosphere felt relaxed yet productive, with good two-way interaction between the instructor and participants. This second session lasted for approximately 30 minutes, and the results obtained were quite satisfactory. Most students who initially did not understand the gross profit and retail method concepts now became more understanding. This increased understanding was seen from the way they answered practice questions correctly and confidently.

At the end of the session, participants were given one quiz question to work on for 20 minutes. After evaluation, the quiz scores obtained were very satisfactory, namely all participants got a score of 100 out of 100. Overall, the activity proceeded in an orderly and conducive manner. Each student appeared active, both during the material delivery session and in the discussion section. The school also gave positive responses to this activity and hoped that training like this could be done again in the future, especially for students outside the competition class who need basic accounting understanding as general provisions. After discussing the material and practice problems, participants were asked to participate in filling out a questionnaire using Google Form. The form of the questionnaire can be seen in the following table:

Table 1. Training Questionnaire

Instructions:

Mark a cross (X) on the number that states your opinion regarding the actual conditions in this training.

Notes:

1 = Strongly Agree

4 = Disagree

2 = Agree

5 = Strongly Disagree

3 = Neutral

A. About Training						
1	Understanding of inventory material	1	2	3	4	5
2	Do you already understand inventory value calculation with gross profit method	1	2	3	4	5
3	Do you already understand inventory value calculation with retail method	1	2	3	4	5
4	Understanding of inventory material practice problems	1	2	3	4	5
5	Is the Material Beneficial	1	2	3	4	5
6	Is the Material Given Beneficial	1	2	3	4	5
7	Should this activity be held again	1	2	3	4	5

Instructions:

Choose one answer between (Yes) or (No) that states your opinion regarding the actual conditions in this training.

A. About Training						
1	Should this activity be held again?	1	2	3	4	5
2	Is this activity interesting?	1	2	3	4	5

Instructions:

Provide your criticism for this training and suggestions for the next training.

Criticism	
Suggestion	

Thank you for your participation in filling out this questionnaire.

The questionnaire answers provided were then processed with the following results:

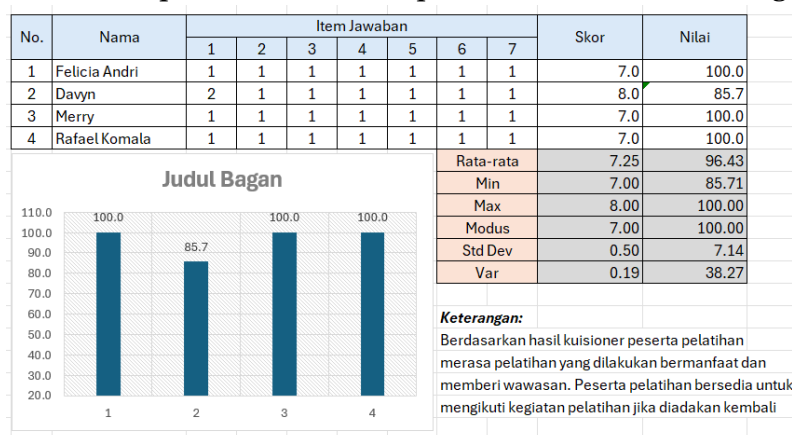




Figure 6. Questionnaire Results

Based on the implementation and evaluation of the PKM activity, the findings indicate a highly successful and impactful training session. The analysis of participant answer sheets revealed an exceptional level of comprehension, with three out of the four students achieving a perfect score by correctly answering all seven questions posed to them. The fourth participant also demonstrated a strong command of the material, securing a score of 85.7%. This collective performance underscores the effectiveness of the material delivery and the participants' successful absorption of the advanced accounting concepts. Furthermore, the feedback gathered through post-training questionnaires unanimously affirmed that all participants found the training session to be both beneficial and engaging. The students reported that the activity provided them with valuable new insights and expressed a clear willingness to participate in similar training sessions in the future. This positive reception highlights the training's success not only in transferring knowledge but also in fostering a genuine interest in the subject matter. The activity successfully yielded two key outputs: a mandatory scientific publication in an ISSN-registered journal and an additional output in the form of an Intellectual Property Right (IPR), demonstrating a significant and tangible contribution to both academic discourse and practical, protectable intellectual assets.

4. Conclusion

The activity was successfully conducted at SMA Kristen Yusuf, which provided a conducive environment and strong support. The training was attended by four selected students from grades 11 and 12 and was held face-to-face on September 25, 2025. The event was orderly, interactive, and divided into a 45-minute theory session on accounting and inventory estimation, followed by a practice problem session where students participated enthusiastically.

The high level of participant engagement demonstrated that the delivery method was effective in capturing attention and increasing learning motivation. The school's provision of facilities and logistical support was crucial to the activity's success. Feedback from participants indicated satisfaction with the clear material delivery, enjoyable atmosphere, and effective instruction, which also increased their interest in independently learning accounting.

A key limitation was the small number of participants, as only competition-class students were involved. Furthermore, the session duration of under two hours was insufficient for in-depth discussion of technical topics. For future activities, it is recommended to extend the training over multiple sessions and incorporate more interactive tools and visual media to improve understanding and engagement.

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