

# Educational Idealism: One More Reason to Stress the Perpetual Inventory System in Classroom Instruction

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**T**echnological innovation has made possible dramatic changes in the way business enterprises maintain their inventories. Ongoing efforts to control and reduce inventory costs have motivated many companies to adopt just-in-time (JIT) systems. These systems minimize stockpiling by perpetually acquiring inventory on an as-needed basis. JIT adoptions and inventory reductions continue. As evidence of this trend, the *Wall Street Journal* cited increasing reliance on trucks, or *rolling inventories*, and the dramatic drop in warehouse construction during the past 2 years, despite significant expansions in retail space (Harper, 1994). Similarly, the authors of a recent study in the *Journal of Cost Management* indicated that the growing number of firms reporting JIT conversions also confirms striking inventory declines (e.g., an average of nearly 50% for the manufacturers surveyed) (Swenson & Cassidy, 1993). Thus, for a growing number of practitioners, the perpetual system is the method of choice.

Some textbook authors have responded to the changes in business practice by providing expanded coverage of the perpetual inventory system. Even so, many

**ABSTRACT.** Technological changes have enabled many companies to shift their inventory systems from the periodic to the perpetual approach. The promulgation of new rules and regulations by the Financial Accounting Standards Board, and the Securities and Exchange Commission, and the Accounting Education Change Commission's exhortation to educators to stress communication and critical thinking skills, have resulted in a crowded curriculum in which educators are forced to make tough choices regarding what to emphasize in their courses. In this article, we urge academicians to shift the emphasis from the periodic to the perpetual system. We cite arguments by education theorists and emerging business trends as justification and show that such a shift would promote educational idealism as defined by the Accounting Education Change Commission and education theorists.

accounting educators may be reluctant to devote additional time to this topic. The promulgation of new rules and regulations by the Financial Accounting Standards Board (FASB), the Securities and Exchange Commission (SEC), and other authoritative bodies has created an information overload problem. In addition, the Accounting Education Change

Commission (AECC) has encouraged educators to stress communication and critical thinking skills as well as technical competency. The result is an overburdened program that forces instructors to eliminate rather than augment content (Edmonds & Alford, 1989). Given the existing time constraints, which method should be given the greater emphasis? Education theory as well as current trends in business practice suggest that the perpetual inventory method should be given priority.

## Educational Idealism

The primary goal of the educational process is the facilitation of meaningful learning as opposed to blind memorization (Oxford Centre for Staff Development, 1992). The AECC (1990) has echoed this sentiment by its advocacy of a *life-long learning to learn* educational philosophy. Education theory identifies four primary features of instruction that promote meaningful learning: *meaningful content*, *progressive differentiation*, *integrative reconciliation*, and *control of complexity* (Ausubel, Novak, & Hanesian, 1978). Our analysis suggests

that the perpetual method offers far greater opportunities for the inclusion of these features in an instructional plan to introduce students to the accounting treatment of inventory costs.

### *Meaningful Content*

We begin with the axiom that meaningful learning requires meaningful content. The use of the periodic system as a medium of instruction suffers in at least three important ways: It is rationally inconsistent with student perceptions, accrual accounting concepts, and assumptions about cost flows.

*Student perceptions.* The periodic system is counterintuitive to students' experience as consumers and retail customers. Sellers usually know the price of products and whether or not items are in stock. Why is the same not also true of an item's cost? Similarly, the very choice of a periodic inventory system seems irrational from a managerial perspective. It creates the impression that management has deliberately decided *not* to keep track of the inventory on hand, raising such questions as how management can operate successfully without any means of knowing when it is time to reorder. In short, the periodic method is inconsistent with the experiences students bring to the subject of inventory.

*Accrual concepts.* More important, the periodic system is inconsistent with fundamental notions of accrual basis accounting. In particular, the accrual accounting model recognizes events and circumstances as they occur without regard to the timing of the cash exchange (FASB, 1988). Product costs are capitalized in asset accounts until the goods are used (i.e., sold) for the production of revenue. At the time the goods are sold, the product costs are removed from the asset account and placed in an expense account. The perpetual method of accounting for merchandising transactions is consistent with these concepts because inventory costs are capitalized in asset accounts at the time of acquisition and expensed at the point of sale. Although the objectives of accrual accounting are accomplished eventually through a year-end adjustment in the

periodic system, the entries made at the time goods are acquired or sold do not fully reflect these effects. Students having difficulty understanding accrual accounting concepts are likely to find the periodic recording procedures arbitrary. Because arbitrary material cannot be assimilated meaningfully in a cognitive structure, students are left with no choice but to memorize.

*Cost flow acronyms.* A similar problem exists with regard to inventory cost-flow concepts. The acronyms FIFO and LIFO apply to the identification of which costs are assigned to the expense account *cost of goods sold*. Under the periodic method, students are taught to focus their attention on the determination of the cost of *ending inventory*. Therefore, the acronyms are inconsistent with the computational procedure, making the presentation appear arbitrary. For example, whereas the FIFO acronym tells the student to focus on the *first costs* to determine cost of goods sold, the computational strategy under the periodic approach forces them to use the *last costs* in to determine the cost of ending inventory. Again, students are encouraged to memorize instead of comprehend because the content is not meaningful.

These arguments are not meant to suggest that the periodic method is wrong or void of any meaning. In a low-technology environment, the periodic method is certainly a logical method of record keeping for high-volume/low-cost merchandise. However, because it is a recording procedure designed to reduce the burden of a strict application of accrual accounting concepts, it is not an effective means of demonstrating the very concepts it was designed to bypass. Because of its limited utility to explain core concepts, the periodic method does not provide an effective forum for classroom instruction.

### *Progressive Differentiation*

The second feature of meaningful instruction, *progressive differentiation*, is concerned with the order in which material is presented to students. Ausubel (1963) suggested that meaningful learning is facilitated when the most general and inclusive concepts are presented

first, with subcomponents of the knowledge base then differentiated through detail and specificity. This hierarchy corresponds to the way in which knowledge is represented, organized, and stored in the human nervous system and is thus consistent with how individuals confront and assimilate new or unfamiliar information.

The focus on detailed recording procedures required under the periodic inventory method thwarts the implementation of progressive differentiation. Students become so involved in the procedures that they lose sight of the core concepts. In contrast, the perpetual method reinforces these concepts. Inventory costs, such as transportation-in, flow directly into the inventory account, thereby emphasizing the premise that these costs should be capitalized. The perpetual method also eliminates the maze of possible alternatives for adjusting and closing entries required under the periodic system. Because the perpetual method transfers the cost of merchandise sold to expense at the point of sale, the only year-end adjustment needed is the recognition of any lost, damaged, or stolen merchandise. The perpetual system offers the opportunity to emphasize core concepts over procedural detail.

### *Integrative Reconciliation*

The principle of *integrative reconciliation* suggests that meaningful learning is facilitated when new and old units of knowledge are blended together so as to form a unified whole. The blending process requires the recognition of differences and similarities between the new and existing ideas. Integrative reconciliation can be thwarted by two conditions.

*Differences made to appear similar.* Although there are significant differences between the perpetual and periodic inventory methods, these differences are obscured by the traditional practice of using the same algorithm for presenting inventory costs in the income statements of merchandising and manufacturing entities. Typically, students are introduced first to the periodic method in the context of a merchandising firm. They are taught to display the computation of cost of goods sold in the income

statement according to the following format:

|                                  |     |
|----------------------------------|-----|
| Beginning inventory              | xxx |
| Plus net purchases               | xxx |
| Cost of goods available for sale | xxx |
| Less ending inventory            | xxx |
| Cost of goods sold               | xxx |

Later, this same algorithm is used in the income statement of manufacturing companies that are maintaining their inventories under the perpetual method. Although textbook wording and lecture comment may be changed, the new algorithm is undeniably periodic:

|                                      |     |
|--------------------------------------|-----|
| Beginning finished goods inventory   | xxx |
| Plus cost of goods manufactured      | xxx |
| Cost of goods available for sale     | xxx |
| Less ending finished goods inventory | xxx |
| Cost of goods sold                   | xxx |

Using the same algorithm for both the periodic and perpetual methods inhibits comprehension because it obscures the significant differences between the two recording procedures. It implies that cost of goods sold is computed in the same manner under both methods. In fact, significant differences in the cost-of-goods-sold figure can occur when the two methods are applied to the same accounting events because they differ in the way the expense is determined. By recording the decreases in inventory at the point of sale, the perpetual method includes only the units sold in determining cost of goods sold. By subtracting ending inventory from the cost of goods available for sale, the periodic method includes the cost of lost, damaged, and stolen merchandise in the cost-of-goods-sold amount. The algorithm is confusing not only because it fails to make differences explicitly clear, but because it constitutes an inaccurate description of the perpetual method.

The failure to distinguish significant differences between the two methods is compounded by the fact that the periodic system is stressed for merchandisers, whereas the perpetual system is used exclusively for manufacturers. This treatment can create the mistaken impression that the significant differences between the two methods are associated with business structure, when they are, in fact, associated with its technical capacity to record information contemporaneously. Meaningful learning would

be better served if the perpetual method were stressed for both types of enterprises. The periodic system could then be discussed as a secondary alternative, and the algorithm could be correctly introduced as the method's distinguishing characteristic.

*Similarities made to appear different.* This second violation of integrative reconciliation also is apparent from the periodic method's cost-of-goods-sold algorithm, presented in its more detailed format below:

|                                      |     |
|--------------------------------------|-----|
| Beginning inventory                  | xxx |
| Plus purchases                       | xxx |
| Less purchase returns and allowances | xxx |
| Less purchase discounts              | xxx |
| Plus transportation-in               | xxx |
| Cost of goods available for sale     | xxx |
| Less ending inventory                | xxx |
| Cost of goods sold                   | xxx |

This computation gives the mistaken impression that beginning and ending inventory are unaffected by purchase returns and allowances, purchase discounts, or transportation-in. In fact, the components of cost for beginning and ending inventory are no different from those for acquisitions made during the current period. Although the components are identical, they are presented as being different. Under the periodic method, students have difficulty reconciling the treatment of current period inventory costs with those of the prior period.

Under the perpetual method, secondary cost factors first flow through the inventory account and then into cost of goods sold at the point of sale. Students are able to see that these cost factors affect beginning inventory, current acquisitions, and ending inventory in the same fashion. Using the perpetual inventory method to introduce students to accounting for merchandising transactions offers opportunities to improve meaningful learning. By highlighting true differences and similarities, the perpetual method provides enhanced levels of integrative reconciliation.

#### *Control of Complexity*

Numerous researchers have warned of the dangers of information overload (Edmonds & Alford, 1989; Miller, 1972; Revsine, 1970). *Information overload* as

used here is defined as the point where complexity exceeds the student's capacity to process information meaningfully. *Complexity* is defined as the combination of the number of distinct dimensions and the interrelationships among those dimensions that are present in the learning environment (Schroder, Driver, & Streufert, 1967). The potential for meaningful comprehension of any given relationship diminishes as the number of relationships increases. *Control of complexity* suggests that these combinations should be minimized when new concepts are introduced.

The number of dimensions and the interrelationships among those dimensions are significantly greater under the periodic method. This result occurs because the periodic method uses separate accounts for the secondary cost factors of purchase returns and allowances, purchase discounts, and transportation-in. Complexity is minimized under the perpetual method because these factors are combined in a single account *inventory*.

Similarly, the periodic method also introduces complexity at the end of the accounting cycle, when special adjusting and closing entries are needed to implement the cost-of-goods-sold algorithm for record-keeping purposes. Again, the complexity of year-end bookkeeping is reduced under the perpetual method because no such entries are needed. Thus, the perpetual method provides a more desirable alternative for the introduction of accounting for merchandising entities. By minimizing the level of complexity, it maximizes the likelihood for meaningful comprehension.

#### **An Alternative Instructional Model**

To evaluate the coverage of the traditional instructional model, we reviewed 11 first-year textbooks with 1993 or earlier copyright dates. These included market leaders and other popular books identified for us by textbook sales representatives. We sought to identify common topics and to assess the depth of coverage provided to those topics. All of the books devoted two chapters to the discussion of inventory topics. Of the 11 books, 8 introduced the periodic method first. Coverage of the perpetual method

frequently was delayed until the second chapter. When the perpetual method was introduced, coverage was significantly limited relative to the discussion of the periodic system. Out of two chapters that averaged 20 pages each, anywhere from a scant three pages to a maximum of seven (including exhibits) were devoted to coverage of the perpetual method. When discussing the perpetual system, many of the books eliminated coverage of several important topics that they included when covering the periodic method. Specifically, we found repeated omissions with respect to selected journal entries, cost-flow patterns, and error effects. Accordingly, the traditional model placed significant emphasis on the periodic method both in terms of topic placement and breadth of coverage.

Books with copyright dates subsequent to 1993 place greater emphasis on the perpetual method. At this stage, the level of diversity is too great to draw generalizations as to the scope and form of this coverage. However, the availability of additional information regarding the perpetual method provides instructors with greater opportunities to change the balance of coverage presented in their respective classrooms. Given changing trends in business practice and the educational arguments discussed above, we suggest the following alternative instructional model.

We believe that the perpetual system should be presented first. Related transportation costs, purchase discounts, and

allowances would be shown in the inventory account. Because costs are to be capitalized in asset accounts until the time that the assets are used for the production of revenue, the perpetual approach is consistent with the accrual accounting concept proposed by the FASB (1988, paragraph 141). Likewise, the approach permits the application of the ingredients of meaningful instruction including logical content, progressive differentiation, integrative reconciliation, and control of complexity. Once students understand the concepts associated with accounting for inventories under the perpetual method, the periodic approach can be introduced as a labor-saving recording procedure that is used in manual accounting systems. The alternative instructional model places greater emphasis on the perpetual system both in terms of order of presentation and breadth of coverage.

### Conclusion

We are not arguing for the abandonment of all coverage of the periodic method. Indeed, accounting graduates can expect to encounter settings in which the periodic system is clearly the practical choice. However, with opportunities for implementing perpetual systems likely to continue, a similar shift in instructional emphasis is needed. The potential benefits of implementing this change extend far beyond a better reflection of evolving business practice. The perpetu-

al system offers instructors a more effective means of illustrating and reinforcing fundamental accrual accounting concepts. A shift in focus to the perpetual system would be consistent with the primary goal of the educational process, fostering meaningful learning.

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