

Leveraging Spreadsheets to Learn the Mechanics of Accounting

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Abstract

Teachers in Introductory Financial Accounting courses face the question of whether to teach the mechanics of the double entry accounting process or to focus on analyzing the financial statements themselves. We, like many faculty, believe that fully understanding the mechanics of the accounting process is key for successfully analyzing financial statements. Thus, the question becomes: How can one introduce the mechanics of accounting without burying students in the detailed, and for many, counterintuitive accounting terminology of debits, credits, and T-accounts? We present a teaching tool that we have found effective in helping to achieve this objective. The tool uses spreadsheets to capture the accounting entries and to show their impact on financial statements. Here we describe the features of this spreadsheet teaching tool and discuss some of the advantages that this method enjoys over other ways of teaching the mechanics of accounting.

Section 1: Introduction

Teachers in Introductory Financial Accounting courses face the question of whether to teach the mechanics of the double entry accounting process or whether to instead focus on analyzing the financial statements themselves. The sequencing of chapters in most introductory financial accounting textbooks is consistent with the belief that students who first understand the mechanics of the accounting process will be successful at later analyzing financial statements. Thus the question becomes: How can one most efficiently introduce students to the system of double entry accounting? In this paper we present a spreadsheet teaching tool that can be used for achieving this objective rigorously and yet intuitively.

The traditional approach to teaching the mechanics of double entry accounting uses journal entries, ledgers, and worksheets, and the specialist terminology of debits and credits. Vangermeersch (1997) argues that fluency in this traditional method is an essential skill for future accountants and business owners. But while this traditional method provides an effective and integrated method for some faculty and students, for others the debit and credit terminology seems to interfere with the development of a fundamental understanding of accounting. Some accounting professors opt instead for a computerized accounting program, such as Peachtree Accounting or QuickBooks, where students enter transactions and adjustments, and the program produces the final financial statements. In this approach, the mechanics are hidden and the accounting cycle becomes a black box.

In our experience, both the traditional and computer program approaches can hamper the development of a comprehensive understanding of the overall financial recording and reporting system. Over numerous semesters, we have found a number of problems with these two approaches. First, maybe because of their seemingly

counterintuitive definitions, the debit and credit approach did not seem to “stick” well with students, as also observed in Bouwman (1996). As a result, students memorized the debit and credit procedures, only to forget the rules weeks after the midterm exam. Second, for the novice, the system of journal entries, and T accounts was an organizational nightmare. Consequently, teaching the double entry system well, using the debit and credit approach, typically consumed a lot of class time relative to the benefit derived by the students from focusing on this method. On the other hand, while, the computerized approach circumvents the use of debits, credits, T account and ledgers, it also makes the whole accounting process invisible. This deprives the students of the opportunity to gain an understanding of the flows in and out of accounts and of the overall articulation of the accounting system.

Others have experienced the same concerns. Ingram (1998) argues that the debit and credit terminology is not intuitive to most students, and describes the possibility of teaching double entry accounting without using this terminology in introductory accounting classes. Elam (1995) points out that like the study of Latin, learning debits and credits is interesting from a historical perspective but is not in demand in everyday practice. Pincus (1997) also argues against the inclusion of debits and credits in introductory courses on account of its effects on students selecting a major. However, since it is widely agreed that all accounting majors must master the traditional mechanics and the software that support the mechanics, she suggests that a short course be offered after the initial financial accounting class to bridge the gap in terminology.

These concerns have led us to develop a teaching tool that provides an alternative approach to transaction analysis and to teaching the accounting cycle as a whole, while avoiding the need for debit and credit terminology. Our approach to the mechanics of accounting takes advantage of spreadsheet technology capabilities to build and strengthen an understanding of the accounting reporting system. The use of spreadsheet technology allows students to leverage their intuitive understanding of the impact of transactions in terms of “increasing” or “decreasing” balance sheet account values. Further, it provides an organized approach to visualizing the impact of transactions on account values. Rather than debits and credits and independent ledger or T-accounts, the spreadsheet integrates all aspects of the accounting cycle in one tool. Values relevant to any transaction are lined up in one column. Values relevant to any account are lined up in one row. The spreadsheet can be used to track account values throughout the accounting cycle and can also simplify the process for constructing financial statements. The integration of Excel into the accounting cycle also provides an important benefit to students in that they learn, use, and apply spreadsheet skills in conjunction with learning accounting.

The paper proceeds as follows. In section 2, we provide a general overview of our teaching tool. Section 3 provides a detailed example. In section 4 we discuss the advantages that this method enjoys over more traditional ways of teaching the mechanics of accounting, and in section 5, we point out potential limitations. We summarize and conclude in section 6.

Section 2: An Overview of the Method

We integrate teaching the accounting cycle with the use of spreadsheet software. The use of spreadsheets to track the accounting cycle is a natural application of skills that many students already possess. For students lacking spreadsheet modeling skills, it provides an opportunity to learn the rudiments of Excel in a business application setting. Our method incorporates the standard steps of the accounting cycle: 1) analyzing and recording transactions, 2) determining trial balances, 3) recording adjustments, 4) accumulating post adjustment account balances and finally, 5) using the information to construct financial statements. In addition, the method embeds an analysis of cash flows throughout the accounting cycle.

The worksheet is based on taking the horizontal balance sheet equation presented in introductory financial accounting texts and reformatting it by rotating it into a vertical format. So, instead of a column for each account, each account is in a row. In this format, each row of the spreadsheet serves as a ledger to aggregate the impact of transactions on a specific account. Each column records a transaction or adjusting entry. Furthermore, by inserting summation formulae, one can calculate the trial balance and the ending balance for each account (row) and create a built in method for identifying balancing errors as they occur transaction by transaction.

The first step is to set up the worksheet. At the top of each worksheet, we include a row for the company name and for the time frame. This helps focus students on the time period assumption that underlies accounting. Down the left hand side (column A) of the worksheet, we insert balance sheet account titles. A row is highlighted in black to demarcate assets from liabilities and owner's equity. A summary row is inserted for Total Assets, and also one for Total Liabilities and Owners' Equity. This allows students to focus on changes in assets versus changes in liabilities and owners equity and provides a visual cue that reinforces that the accounting equation (assets = liabilities + owners equity) must hold transaction by transaction. Accounts are organized in the typically accepted balance sheet order with assets and liabilities listed in order of liquidity. The worksheet can also be formatted with adequate room to add accounts as needed.

Figure 1 displays a basic worksheet. Each column to the right of the headings (column B and on) is used to record transactions, one transaction per column. Columns are also inserted for the beginning balances, trial balances, adjustments, and the ending balances. At the top of the worksheet, there are rows for 1) recording the transaction number or date, 2) recording a description of the transaction, and 3) recording the cash flow impact. The use of the worksheet is straightforward. Increases are recorded as positive numbers in the appropriate cells (choosing the row to coordinate with the appropriate account and the column to coordinate with the date or number of the transaction). Decreases are recorded as negative numbers in the appropriate cells. Students are encouraged to jot down a brief explanation of the transaction. To verify transaction by transaction that the accounting equation is preserved, students can insert a check row at the bottom of the worksheet. The check row should be formatted as the sum of the assets less the sum of the liabilities and owners equity. When a transaction balances, the value in the check row should be zero.

This general method follows the same framework as presented in most textbooks for the horizontal balance sheet. With one exception, here the horizontal balance sheet is re-formatted into a vertical report format. As shown in Figure 1, rows for revenues and expenses are added below the retained earnings account. It is helpful when doing this to highlight the rows for these accounts to help students differentiate between temporary and permanent accounts. Blacking out the cells in the beginning balance and ending balance columns for these revenue and expense accounts also helps reinforce in students' minds that these are temporary accounts with no beginning or ending balance.

A final feature of the worksheet to note before moving on to an example is the visibility of the cash flows throughout the accounting cycle. The cash flow statement is sometimes viewed as separate and unrelated to the accounting cycle, but the worksheet model facilitates considering cash flows as an integral part of accounting. As noted above a row has been inserted just below the transaction description for cash flow analysis. Here students can indicate whether each transaction was a cash or non-cash (NC) transaction. If a transaction involved cash, they would note the type of business activity: operating (O), investing (I), or financing (F) activity. This adds a focus on the flow of cash into and out of an organization, helps build and solidify what is meant by operating, investing, and financing activity, integrates the underlying cash flow concepts into the accounting cycle and facilitates the eventual preparation of the cash flow statement. Embedding cash flow analysis into the accounting cycle also reinforces the non-cash nature of adjusting entries. The focus also reinforces the use of accounting information to assess and predict future cash flows.

Section 3: Example

At this point we introduce an example, EJ, Inc, to demonstrate the use of the spreadsheet method as illustrated in Figure 2. Students begin the accounting cycle by entering account titles in the first column (Column A) and beginning balances for the period in Column B. Although not presented in Figure 2, the beginning balances for EJ Inc are provided in the Figure 3 worksheet. Before recording transactions, students should verify that total assets equal total liabilities and owner's equity. At the same time, they should to identify the time period the accounting covers. After setting up the worksheet, they move onto analyzing transactions. First, transaction by transaction, students write a brief description of each transaction. Writing a description provides evidence that the student can

decipher the transaction and helps reinforce the commonality of typical transactions. Descriptions usually include a noun and a verb. For example: issued stock, earned revenue, paid money owed. Next the student determines 1) which accounts are affected, 2) whether the accounts increase or decrease, and 3) the relevant dollar value. Once the transaction has been analyzed, students enter the information into a new column in the worksheet. Running left to right, each column is used to record one transaction. For example, consider the September 1st transaction. EJ, Inc issued \$5,000 worth of common stock. The student would start by entering the date, 9/1, in the appropriate cell in the "Transaction Date" row and enter "issued stock" in the "Transaction Description" row, in the cell directly below the date. To record the transaction, the student will increase the Cash and the Common Stock accounts by 5,000. To enter these values, the student would scroll down the same column until they locate the cells in the "CASH" row and in the "COMMON STOCK" row. They would increase each account by entering "+5,000" in the appropriate cells. Before moving on, the students should evaluate the transaction for the cash flow impact. In the case of the September 1st transaction, the transaction did involve cash. The transaction reflects financing activity since the cash was received in exchange for issuing stock. In the cash flow line, students should therefore record an "F" for financing activity.

On September 3rd, EJ Inc purchased a laser printer for \$1,000 cash. Following the same methodology, students would move to the next column to the right. Going down the column, they would enter 1) 9/3 in the date row and 2) "purchased printer" in the description row. To record the transaction, students will increase equipment by \$1,000 and decrease cash by \$1,000 by entering -1,000 in the cash row, and +1,000 in the equipment row. In regards to cash flow, the September 3rd transaction involved cash. The transaction reflects investing activity since the cash was paid in exchange for a printer. In the cash flow line, students should therefore record an "I" for investing activity.

Transactions involving more than two accounts can also be recorded. For example on September 7, the company sold equipment for \$7,000 cash. The equipment cost \$10,000 and had a book value of \$7,500. To record this, the student would enter +7,000 in the cash account. In addition, -10,000 would be recorded in the PPE account and +2500 would be recorded in the Accumulated Depreciation account to remove the asset from the books. Finally -500 would be recorded in a Loss on Sale income statement account... Since this transaction involved cash received in exchange for equipment sold, students would record an "I" for investing activity in the Cash Flow Impact row.

After each transaction, students are instructed to check that the change in assets equals the change in liabilities and owners equity by verifying that the change above the black line on the worksheet equals the change below the black line. This can be done visually, checking that the entries above and below the black center line net balance each other. Another way to verify the equality when using an Excel version of the worksheet is by inserting a row at the bottom of the worksheet that automatically sums the values above and below the black line and verifies that the net difference is zero. A non-zero figure indicates an error in entering the transaction. Figure 3 displays the worksheet for EJ, Inc. containing the September transactions.

After all transactions for the period are recorded, students find the trial balance by summing the values across each row. The total for each row, and the specific additions and reductions in each row provide a summary of the activity in each account. By mapping the transaction back to its description, it is easy to recapture the exact activities that affect each account. After finding account totals, students also find total assets, and total liabilities plus owners' equity to verify that the accounting equation is maintained. The trial balance serves a number of purposes. It provides verification that $\text{assets} = \text{liabilities} + \text{owners' equity}$ and so provides a check point in the accounting cycle. It also serves to visually separate transactions from adjustments and provides an opportunity to visually reinforce the idea that adjustments do not involve cash. Finally, the trial balance also provides information for adjusting entries, such as for the supplies expense adjusting entry.

Moving forward in the accounting cycle, the worksheet is expanded to incorporate columns for adjustments and post adjustment ending balances. Adjustments are recorded in the same manner as the initial transactions. Students determine which accounts are affected, whether they increase or decrease, and what the dollar value of the change is. Increases are recorded as positive numbers, decreases as negative. For example, as shown in Exhibit 2, the first adjustment for EJ Inc states that "a physical count of supplies shows \$5,500 of supplies on hand. As with

transactions, students write an explanation. Here the explanations all link to either earning revenue or incurring expenses reinforcing key concepts related to adjustments. In the case of accounting for supplies used, the description could be “used supplies” or “incurred supplies expense.” As is shown in Exhibit 3, the supplies account has a trial balance of \$7,500, so the adjustment to update supplies would be -2,000 in supplies account and -2,000 in supplies expense. In regards to cash flow, adjustments never involve cash so the notation in the cash flow row should be “NC” for non-cash adjustment. As with analyzing and recording transactions, students can verify again that the accounting equation balances adjustment by adjustment.

Once adjustments are entered, revenues and expenses are accumulated and closed into the retained earnings account. To do this, as shown in Exhibit 3, a closing column is added to the worksheet to transfer net income from the temporary accounts into retained earnings. Since the revenue and expense account entries are already signed positively and negatively respectively reflecting their impact on owners’ equity, the net income figure can be computed by simply summing across a rectangle of cells that includes the trial balance column and the adjustments columns for the temporary income statement account rows. This summation formula for net income is entered into the cell for the retained earnings row in the closing column.

The final step of the accounting cycle is to determine final balances for all the balance sheet accounts by summing the trial balance plus the adjustments for each row. Ending balances for all assets are summed as is the total of all liabilities plus owner’s equity accounts. When finding the ending balances for owner's equity, students should be instructed to include only the capital stock accounts and retained earnings, so as not to double count income. This can be reinforced by encouraging students to black out the part of the beginning and ending balance columns that relates to the revenue and expense rows. As noted previously, highlighting the revenue and expense accounts draws attention to the distinction between permanent and temporary accounts or between balance sheet and income statement accounts. Students can verify again that the accounting equation balances at the end of the cycle.

Modifications to the Spreadsheet Approach

The spreadsheet approach can be modified to suit a variety of scenarios and teaching styles. First, it does not require computers or Excel knowledge. It can be implemented on a paper spreadsheet. We frequently introduce it using paper spreadsheets before migrating to Excel. Second, some faculty may prefer to record revenues and expenses directly into the retained earnings account, as described in Stickney, Weil, Schipper and Francis (2010), rather than in separate temporary accounts. Recording revenues and expenses directly into retained earnings is a simpler method, but formatting revenue and expense accounts as individual line items below retained earnings helps demonstrate the temporary accounts and aids in translating the data into financial statements. Third, some teachers may wish to include headings and subtotals for current assets, noncurrent assets, current and non-current liabilities and so on in the spreadsheet. While this helps reinforce the idea of good form in the financial statements, it may confuse students into thinking that the spreadsheet is the balance sheet rather than the accounting system. Furthermore with multiple subtotal rows the summations for each side of the balance sheet become more laborious and subject to double counting of accounts.

There are also formatting modifications that can be made to accentuate understanding of the big picture. For example, students can be encouraged to “see” the interrelationships between the financial statements if one uses distinct colors to highlight the information relevant for each of the four statements: one color for the revenue and expense rows; another color for the retained earnings row, a third color for the cash (and cash flow impact) rows and finally a fourth color for the balance sheet account titles column and the corresponding account ending balances column.

Using the Spreadsheet to Create Financial Statements

In addition to streamlining the recording, posting and summarizing of accounting entries, the spreadsheet method provides a visual framework for converting the end results of the accounting cycle into financial statements. The revenue and expense section within owner's equity organizes the income statement data. The Retained Earnings row provides the foundation for the Statement of Retained Earnings. The vertical listing of accounts and ending

balances provides the information for the balance sheet. Finally, the cash and the Cash Flow Impact rows provide the information for creating a Cash Flow Statement.

To convert the data in the worksheet to a formal income statement, Figure 4, the student focuses on the shaded revenue and expense rows in the owners' equity section of the worksheet. Account titles are found to the left, in column A and amounts are found by adding across each revenue and expense row. (Refer back to Figure 3). This information is entered either by copying or referring into another spreadsheet and converted into "good form", by adding category headings, such as Operating Expenses, Other Revenue and Expenses, , as well as subtotal lines, including Total Operating Expenses, Operating Income, and Gross Margin.

To prepare the statement of retained earnings, Figure 4, students focus on the retained earnings row. The first cell in the row gives the beginning balance of retained earnings. The last cell in the row gives the ending balance of retained earnings. Dividends, if declared, will show up as a decrease to retained earnings sometime during the accounting cycle. Finally, net income can be found in the calculation used to close revenue and expense accounts to retained earnings. The student can verify that the value is correct by reconciling the end value of retained earnings from the statement with the ending balance of retained earnings in the final column of the balance sheet worksheet.

Preparing the balance sheet from the worksheet is very straightforward. Students copy and paste into a new spreadsheet the account titles from the left side of the worksheet and the ending balance values from the right side of the worksheet. The account titles and balances are then formatted into good form by incorporating category headings (Assets, Current Assets, Noncurrent Assets, and such) and subtotals, such as Total Current Assets and Totals, such as Total Assets.

Finally a student can use the information on the worksheet to develop a cash flow statement using the direct approach. Focusing on the cash, cash flow explanation, and transaction description rows, the student can match each cash flow to the type of activity and categorize each flow accordingly. Summing the values identified by each type of flow, gives the student a summary measure of changes in cash from each type of business activity. With the two sides of every transaction linked together in the worksheet, rather than separated into various T-accounts, the worksheet can easily be used to identify and categorize each type of cash flow in more detail as well. Increases to cash from operating activity are summed and classified as "cash from customers." Decreases to cash from operating activity are likewise identified, added, and classified as "cash to suppliers." Investing cash flows are identified as purchases (negative flows) or sales (positive flows) of non-current assets. With the visual links to both sides of the transaction, financing cash flows can also be matched and identified as to their type, whether issuance of stock, repurchase of stock, payment of dividends, borrowing funds, or repaying of a loan. As with Retained Earnings, the beginning value of cash, on the left side of the worksheet, and the end value of cash, on the right side of the worksheet, are readily available and can serve as verification of the cash flow calculations.

Section 4: Advantages of the Method

The goal of the method described above is to facilitate learning and understanding of accounting. In the long run it does not replace the need for accounting majors to understand the terms debit and credit, nor does it replace the formal methodology of journal entries on which many computerized accounting programs are built. However, it does serve as an effective learning tool and has a number of significant advantages over both the traditional manual and the more contemporary computerized methodologies. First, the method utilizes intuitive accounting terminology. Second, the worksheet method makes visible the underlying processing that occurs in computerized accounting programs. Third, the worksheet method accentuates many of the underlying accounting concepts. And finally, the worksheet method provides an opportunity to learn and use Excel.

The traditional approach to accounting mechanics involves debits, credits and journal entries, and T-accounts. The terms debit and credit already have meaning for students. The vernacular use of debit and credit relative to credit cards and banking clouds their use in accounting. By using the spreadsheet method, students can learn and appreciate the principles of double entry bookkeeping, its symmetry and its simplicity while avoiding the confusion

caused through the conflicting uses of terminology. The spreadsheet tool instead relies on the easily understood concepts of increases and decreases in account balances. While this tool will not resolve the ongoing debate of whether to teach accounting mechanics, it does provide a systematic method to teach those mechanics that addresses both the concern of Vangermeersch (1997) that teaching accounting not become “avant garde” and the concerns of Pincus (1997) that accounting not become outdated.

The method also circumvents the use of T-accounts and journal entries. The two issues that arise here are both the time it takes to properly teach the use of the manual method as well as the difficulty of organizing T-accounts in a systematic way. While seasoned accountants can create a T-account layout that is organized and logical, that is not always the case for the novice accounting student. The spreadsheet method replaces poorly organized T-account sheets with an organized method for working through accounting cycle problems. With all accounts on one worksheet, organization is built into the ledger process. This reduces the likelihood of errors. The model combines the recording and posting processes thus requiring students to enter data only once thereby reducing errors. Each value is either added or subtracted from the relevant accounts and in the process is automatically embedded in the accounting system. This reduces the chance of transcription errors or simply copying the numbers incorrectly. It also reduces the possibility of other types of errors such as placing numbers on the wrong side of a T-account when posting values from journal entries to T-accounts. Finally, with this model, students can assess transaction by transaction whether the accounting equation is balanced rather than waiting until the end of the cycle.

This method also has added benefits in terms of making connections with the underlying accounting concepts and therefore provides a viable substitute for the traditional methodology. While the traditional method, with its use of journals and ledgers, has value as a teaching tool because it sequentially shows all the steps of the accounting cycle, its use has become antiquated with the advent of computerized accounting programs. Unfortunately, in computerized systems the steps in the accounting cycle are hidden since the programs accept transaction inputs and produce financial statements for the student.

The spreadsheet model provides a very visual tool for understanding transaction analysis. It accentuates the concept that all transactions should balance and that the balance sheet is always balanced after every transaction, not just the accumulation of results overtime. It helps students visualize what is going on behind the formal mechanics thereby making the relationship between transactions and account totals more concrete. Perhaps most importantly, the spreadsheet model accentuates the linkages between the financial statements. All accounts are linked together in a comprehensive model. It helps students understand the impact of revenues and expenses on the accounting equation and on the accounting value of the company. It reinforces the concept of cash flows and how they are linked to actual transactions. Furthermore, if one thinks of a timeline moving from left to right, the spreadsheet reinforces the concept that the balance sheet describes a situation at a point in time (once at the beginning on the left and again at the end of the period on the right), while the income statement, the statement of retained earnings, and the cash flow statement describe the effect of many individual transactions over the intervening time period. This is especially accentuated if one uses color codes to map the different information sets to each of the four statements.

Finally, while the method can be performed manually on a paper spreadsheet, such as for exams, it provides a natural vehicle for encouraging learning and use of Excel. Many students tend to use Excel only as a word processing tool. They enter text and numbers, but often do not use the mathematical functions, preferring instead to add the numbers shown on their spreadsheet using a calculator and then enter the amount rather than use the appropriate Excel tool. In addition, many students do not know how to build a mathematical or business model from a blank worksheet. Some of the specific Excel features that students can learn and apply in using the worksheet are creating formulae within Excel, using the summation function, using formatting features for numbers and text, referencing text and values, and more generally building a useful model from a blank workbook page.

Section 5: Limitations of the Spreadsheet Method

Some people may feel that the exclusion of T-accounts from the recording process limits one’s ability later in the course to perform financial statement analysis and infer information regarding a particular account. For example, if

one wants to infer cash collections from customers by examining the activity in the accounts receivable account. This is especially true for faculty who rely on a T account as a visual prop for summarizing the information. However, one can extract this information from the spreadsheet model by focusing on individual rows in the worksheet and referring back to the descriptions. Alternately, the information for any specific account can be mapped from the spreadsheet model into an accounting equation format: Beginning Balance + Inflow – Outflow = Ending Balance. The beginning balance is found on the left side of the spreadsheet model, inflows are all the positive values in any given row, outflows are the negative values, and the ending balance is found on the right side of the model.

Second, some faculty may view the use of the spreadsheets as a weakness of the tool. As, if a student does not know how to use Excel, he or she will have to learn two things, spreadsheet techniques as well as the accounting process. In some ways this may be no different than the issue that using traditional accounting terminology such as debits and credits, when teaching the cycle, impedes learning. Some may feel that learning Excel can inhibit the understanding of the cycle just as terminology can interfere with learning the accounting cycle. There are two key differences here. First, the tool can be used with paper and pencil thus either delaying or circumventing using Excel altogether. Second, a survey conducted by Clarke and Nitkin (2009) find that most management programs want their students to learn and master Excel and that most management programs embed teaching spreadsheet technology into introductory accounting or finance courses. In this setting, the spreadsheet model provides a useful application of Excel.

More broadly, in regards to using Excel, some may be concerned that students can easily duplicate an existing Excel spreadsheet and just alter the numbers from a previous problem, thereby creating a black box situation. This is a concern with the spreadsheet approach, but also with the traditional journal entry and T accounts approach. Faculty can discourage this behavior by not referring to the worksheet as a template. They can also remind students of the potential for computational errors caused by using pre-inserted formulae which may or may not end up referring to the correct cells. Others may actually view this duplication feature as strength, since it can allow students to complete more practice problems in an allotted time.

Finally, some faculty may find that the spreadsheet becomes awkward to visualize on a computer screen when there are two or more pages of transactions or accounts. This is remedied to a major degree by using the Freeze Panes feature in Excel, to freeze the account titles in the first column and the transaction description in the upper rows of the spreadsheet as one scrolls up and down, and right and left across the file.

Section 6: Conclusion

While the example provided here is relatively simple, it is typical of accounting cycle problems in introductory financial accounting books. Students and faculty can adapt and modify the spreadsheet as needed. For example, accounts can be added or removed by inserting or deleting rows as needed. Additionally columns can be added or deleted to account for the required number of transactions and adjustments. The spreadsheet model can handle both simple transactions as well as transactions that affect multiple accounts as in any given transaction each individual account will be affected only once.

We have used this method at the graduate and undergraduate level with both business and non-business students using paper and Excel approaches for over ten years. It has been our observation that using this tool for teaching accounting mechanics aids in the learning process. Our hope is that by improving the learning of accounting, the intuitive nature of this method should also improve retention. While we find this method useful for students in any introductory accounting course, it may be especially relevant for students who need to "understand" accounting more than they need to "do" accounting. This may be the case in undergraduate, general management degree programs and in MBA programs. Here, especially, an understanding of what the numbers mean and mechanics of how the numbers are generated and incorporated into the financial statements may be more important than the terminology of debits and credits.

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Figure 1: Spreadsheet Model

Company Name																	
Time Period																	
Transaction Date	Begin. Bal.															Trial Bal.	End Bal.
Transaction Description																	
Cash Flow Impact																	
Assets																	
Cash																	
AR																	
Supplies																	
Equipment																	
Accumulated Depreciation																	
Total Assets																	
Liabilities & Owner's Equity																	
Accounts Payable																	
Interest Payable																	
Loan Payable																	
Common Stock																	
Retained Earnings																	
Revenue																	
Salary Expense																	
Supplies Expense																	
Interest Expense																	
Depreciation Expense																	
Total Liab. & OE																	
Check row																	

Figure 2 – Typical accounting cycle problem

Ellen started her own firm, EJ Inc. about 5 years ago. Her business provides custom invitations. Below are the transactions for her company for the month of September. Complete the accounting cycle for Ellen by recording the transactions, finding the trial balance, recording the adjustments, finding post adjustment ending balances, and constructing a set of financial statements

Transactions

- 1-Sep Issued \$5,000 worth of common stock
- 3-Sep Purchased a laser printer for \$1,000 cash
- 7-Sep Sold equipment costing \$10,000 for \$7,000. Depreciation of \$2,500 had been recorded since the equipment was purchased
- 10-Sep Completed a printing job worth \$1,200 on account
- 12-Sep Declared and paid \$3,000 in dividends
- 15-Sep Received \$3,400 cash for a current printing job
- 17-Sep Borrowed \$2,000. The money is due in 2 years and carries 12% interest payment
- 20-Sep Purchased \$1,500 supplies on account
- 27-Sep Paid salaries of \$1,050 for the month of September
- 29-Sep Collected \$700 from customers on open account

Adjustments

- 30-Sep A physical count of supplies reveals \$5,500 on hand
- 30-Sep Completed a \$1,000 printing job that was not yet billed
- 30-Sep Accrued \$90 interest owed on loan payable
- 30-Sep Recognized depreciation expense of \$350

Figure 3: Spreadsheet Model

Company Name		EJ Incorporated																
Time Period		Month of September																
Transaction Date	Beginning Balance	1	3	7	10	12	15	17	20	27	29	Trial Bal.	30	30	30	30	30	End Bal
Transaction Description		issued stock	bought printer	sold equipment	credit sale	paid div'd	cash sale	loan	bought supplies	paid salary	collect cash		supply expense	earned revenue	interest expense	deprec. expense	closing	
Cash Flow Impact		F	I	I	NC	F	O	F	NC	O	O		NC	NC	NC	NC	NC	
Assets																		
Cash	11,000	5,000	(1,000)	7,000		(3,000)	3,400	2,000		(1,050)	700	24,050						24,050
AR	10,000				1,200						(700)	10,500		1,000				11,500
Supplies	6,000								1,500			7,500	(2,000)					5,500
Equipment	35,000		1,000	(10,000)								26,000						26,000
Accumulated Depreciation	(3,000)			2,500								(500)				(350)		(850)
Total Assets	59,000											67,550						66,200
Liabilities & Owner's Equity																		
Accounts Payable	5,000								1,500			6,500						6,500
Interest Payable															90			90
Loan Payable	7,000							2,000				9,000						9,000
Common Stock	20,000	5,000										25,000						25,000
Retained Earnings	27,000					(3,000)						24,000					1,610	25,610
Revenue					1,200		3,400					4,600		1,000				
Salary Expense										(1,050)		(1,050)						
Supplies Expense												-	(2,000)					
Interest Expense												-			(90)			
Depreciation Expense												-				(350)		
Loss on sale				(500)								(500)						
Total Liab. & OE	59,000											67,550						66,200
Check row		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Figure 4: Financial Statements for EJ Inc.

**Financial Statements for EJ Incorporated
9/30/200x**

EJ Incorporated
Balance Sheet
as of September 30, 200x

Current Assets	
Cash	\$ 24,050
AR	11,500
Supplies	<u>5,500</u>
Total Current Assets	41,050
Non-Current Assets	
Equipment	26,000
Accumulated Depreciation	(850)
Total Non-Current Assets	<u>25,150</u>
Total Assets	<u><u>\$ 66,200</u></u>

Liabilities & Owners Equity

Current Liabilities	
Accounts Payable	\$ 6,500
Interest Payable	<u>90</u>
Total Current Liabilities	6,590
Non-Current Liabilities	
Loan Payable	<u>9,000</u>
Total Non-Current Liabilities	<u>9,000</u>
Total Liabilities	15,590
Owners Equity	
Common Stock	25,000
Retained Earnings	<u>25,610</u>
Total Owners Equity	<u>50,610</u>
Total Liabilities & Owners Equity	<u><u>\$ 66,200</u></u>

EJ Incorporated
Income Statement
for month ending September 30, 200x

Revenue	\$ 5,600
Operating Expense	
Supplies	2,000
Salary	1,050
Interest	90
Loss on Sale	500
Depreciation	350
Total Operating Expenses	<u>3,990</u>
Net Income	<u><u>\$ 1,610</u></u>

EJ Incorporated
Statement of Retained Earnings
for month ending September 30, 200x

Beginning Balance, Sept 1	\$ 27,000
Net Income	1,610
Dividends	<u>(3,000)</u>
Ending Balance, Sept 30th	<u><u>\$ 25,610</u></u>

EJ Incorporated
Statement of Cash Flow
for month ending September 30, 200x

Operating Cash Flow	
Cash from customers	\$ 4,100
Cash paid to suppliers	<u>(1,050)</u>
Net Operating Cash Flow	3,050
Investing cash flow	
Cash received from sale of PPE	7000
Cash paid to purchase equipment	<u>(1,000)</u>
Net Investing Cash Flow	6,000
Financing Cash Flow	
Issued Common Stock	5000
Borrowed loan payable	2,000
Payment of Dividends	<u>(3,000)</u>
Net Financing Cash Flow	4,000
Net Change in Cash	<u><u>\$ 13,050</u></u>
Ending Balance, Sept 30	\$ 24,050
Beginning Balance, Sept 1	<u>11,000</u>
Net Change in Cash	<u><u>\$ 13,050</u></u>