



Student learning style and educational outcomes: evidence from a family financial management course

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Abstract

The academic performance of 419 undergraduate students in an individual financial management class was evaluated in light of their learning style, demographic background, academic history and time allocation. Academic history and time use variables proved to be the only significant predictors of grades in the course. Student learning style, as measured by Kolb's Learning Style Inventory, was not a strong predictor of success in this financial management class, and it appears that no single type of learner best grasps financial management concepts. The implications of these findings lead to a discussion of instructional methods. © 1999 Elsevier Science Inc. All rights reserved.

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1. Introduction

Instructors of individual financial management hope to contribute to the intellectual development of every student in their class. In working toward this goal, most instructors provide a variety of opportunities to learn. However, class size, time constraints, and the broad range of complex topics inherent to most financial management classes present

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significant challenges to the instructor. Given these restrictions, a major challenge for instructors is making informed choices on which activities to use to best demonstrate and transfer the intended information and skills. A promising approach for assessing the appropriateness of learning opportunities to provide for students is the use of Kolb's Learning Style Inventory (LSI). The use of this tool may contribute to improved quality and effectiveness of teaching, student learning, and academic success. The first purpose of this paper is to introduce this tool, and the learning style theory on which it is based, to personal finance educators. A second purpose is to explore the relationship of student learning style and academic outcome in a personal finance course.

While the link between learning style and teaching effectiveness has been established in other academic disciplines, research has not been conducted in the area of individual financial management. Though recent studies such as Vihtelic (1996) identify the effectiveness of teaching financial concepts in a framework of personal finance, no study has yet linked learning styles to student outcomes in personal finance. Additionally, courses in financial management involve a wide range of both mathematical and verbal application, thus providing a good environment for evaluation of the complete teacher-student learning process. Further, Stitt-Gohdes (1999) discussed the implications of learning styles in the context of business teacher education and felt student focused and individualized instruction to be increasingly important given the changing demographics of the student population, changes in technology-based instruction, and the increase in the population of academically at-risk students. By diagnosing student learning style, instruction can be individualized (Dunn, 1984), therefore addressing these new challenges and providing an opportunity for increased effectiveness in instruction and learning in financial management classes.

2. Review of literature and theories of learning

While learning can be defined as an internal process that occurs when an observable, permanent change takes place (Kaplan & Kies, 1993), a learning style can be described as the way people retain or absorb information (De Bello, 1990). More formally, learning style can be defined as a biological and developmental set of personal characteristics defined by the way individuals process information (Dunn, Beaudry, & Klavas, 1989; Dunn, 1984). Research has shown students to be characterized by different learning styles (Kolb, 1981). Depending on the learning style, students focus on different types of information, perceive information differently, and understand at different paces (Barbe & Milone, 1981; Claxton & Murrell, 1987; Felder, 1993; Felder & Silverman, 1988; Kolb, 1984; Schmeck, 1988).

Financial management instructors may be able to benefit from the notion that students possess individual differences in learning style. Greater insight into the learning process can yield different approaches and outcomes for both instructor and student. Research has found that presenting information through a variety of approaches leads to more effective instruction (Doyle & Rutherford, 1984; Kavale & Forness, 1987; McCarthy, 1990; O'Neil, 1990; Snider, 1990). Learning style has proven to have an impact on the effectiveness of student learning, resulting from student response to different teaching methods. For example, Heitmeyer and Thomas (1990) found students to be more comfortable with certain instruc-

tional strategies than others as a result of their preferred learning style. Additionally, research has shown improved attitudes, behavior, and grades when the instructional environment complements the student's learning style preference (Dunn et al., 1989; Marshall, 1991). Conversely, ignoring learning styles, thus treating students as a homogenous group of learners, may have a negative outcome. For example, Marshall (1991) suggested that students who respond to nontraditional learning were at risk because their learning style was not accommodated in the traditional school environment.

2.1. Kolb's model of learning styles

According to Kolb (1981), learning is a circular process moving through four stages. The learning process proceeds with the learner taking a concrete experience (concrete experience), observing and reflecting upon it (reflective observation), forming an abstract concept and/or generalization (abstract conceptualization), and testing the concept in a new situation (active experimentation). The process is circular because the learner approaches another concrete experience thus restarting the learning process, this time with the newly acquired concept(s) from the previous learning cycle(s).

Kolb operationalized his learning theory by formulating two dimensions, perceiving and processing. Concrete experience (CE) and abstract conceptualization (AC) at the opposite ends of the continua of the perception dimension represent feeling and thinking, respectively. Individuals who prefer learning through concrete experience are generally adaptable to new environments, fully engage in the moment and task at hand, and excel at hands-on learning. Learners who tend toward abstract conceptualization engage in problem solving, deductive reasoning and enjoy the practical application of concepts or ideas (Kolb, 1981). Active experimentation (AE) and reflective observation (RO) are the opposing extremes of the processing dimension. Learners along this dimension process information either actively, by doing or reflectively, by watching. It is important to note that students in varying degrees utilize the four modes of learning.

Kolb's Learning Style Inventory (LSI) classifies students into one of four learning styles based on how they rank order nine sets of four words. Scores from the LSI are plotted along the dimensions placing the learner into a quadrant based on two learning modes. The quadrants represent the following four learning styles: diverger (CE-RO), assimilator (RO-AC), converger (AE-AC), and accommodator (AE-CE).

1. **Diverger.** A student classified as a diverger perceives information through concrete experience and processes it through reflective observation. A diverger may best process information by their feeling and by observation. Divergers do well with viewing a concept or idea from many perspectives. Divergers are characterized as being emotional, people-oriented, and imaginative. They are good at working in a group and at blending many different experiences or pieces of information into a whole (Kolb, 1981). An important financial management concept is the time value of money. A diverger may best grasp the future value of an annuity by working through a problem set with varying interest rates and duration rates (concrete experience) followed by the comparing and contrasting of the resulting future values (reflective observation).

2. **Assimilator.** An assimilator perceives information through abstract conceptualization and processes information through reflective observation. The assimilator may gain more from an assignment requiring the construction of a model. Assimilators are more systematic in their approach to ideas and theories. An assimilator prefers to digest and think about the information (Kolb, 1981). An effective appeal to an assimilator would be to require them to devise a comprehensive personal financial plan for a fictitious client (abstract conceptualization) and to keep a log or journal (reflective observation) of each component or step of the process, reinforcing the grasping/learning process.
3. **Converger.** A converger perceives information through abstract conceptualization and processes it by active experimentation. A converger approaches ideas and theories systematically, and ideally transforms information by applying the ideas and information to practical situations, such as laboratory experiments. Convergents are less people-oriented and more technically minded (Kolb, 1981). A lecture in tax planning (abstract conceptualization) followed by preparation of a family's tax return (active experimentation) is a good example of a learning structure tailored to convergers.
4. **Accommodator.** Students classified into the accommodator learning style perceive information through concrete experience and process it through active experimentation. Accommodators may learn most effectively through a hands-on experience, may prefer to engage in an activity related to the topic, or use the information in trial and error exercises. Accommodators learn from interactions with others, and can be characterized as being risk takers, and enjoying new challenges and experiences (Kolb, 1981). Learning about credit usage through analyzing the terms of their credit cards (concrete experience) followed by ordering their own credit report, or examining credit reports exemplifying bad credit (active experimentation) would appeal to an accommodator.

2.2. Learning styles and educational outcomes

This section reviews the major empirical findings in the learning style literature. First, the effectiveness and difficulties of identifying learning styles is discussed. Second, the literature identifying learning styles that characterize particular disciplines is reviewed. Finally, previous attempts to link learning style to academic outcome are discussed.

Studies have found effective instruction to be accomplished through multiple approaches (Lacina, 1991), suggesting the importance of recognizing multiple types of learners. Claxton and Murrell (1987) recommend that instructional methods include all four learning style modes to give each student with a unique learning style the opportunity to do well a quarter of the time. They found students retained 20% of information if instruction appealed only to abstract conceptualization and 90% of the information if teaching strategies related to all four learning styles. Dunn (1984) found that students whose learning style matched with the teaching method and environment earned better grades. Further, research has shown students retain information longer, apply the information more effectively, and maintain positive attitudes toward the course content when teaching strategies and methods are compatible with student learning style (Felder, 1993).

Based on Kolb's learning style theory, studies have found that learning style can be

matched with particular disciplines. Kolb (1981) found the learning styles of over 800 managers and business graduate students to vary with their undergraduate major. Accommodators tended to major in business; convergers in engineering; divergers in history, political science, psychology, and English; and assimilators in sociology, mathematics, chemistry, and economics.

While studies have been able to successfully classify students in the traditional academic disciplines, research has yet to examine an interdisciplinary area such as family and individual financial management. Business related studies are a close approximation. In a sample of business graduate students, Bergevin (1993) found a convergent learning style to be dominant among finance and accounting majors, whereas marketing and management students were predominantly classified as experience-oriented (accommodators and divergers).

Studies examining Kolb's learning style as a predictor of academic performance emerge from a variety of disciplines. Some, for example, Garvey and Bootman (1984), found significant associations between predominate learning style and overall grade point average. However, others found no significant differences in mean overall GPA, mean class GPA and learning styles (Heitmeyer & Thomas, 1990) and found learning style to be an inadequate predictor of academic success (Leiden, Crosby, & Follmer, 1990).

No empirical studies have found, or even tested, the correlation between Kolb's LSI and academic success in an individual financial management course. Paulsen & Gentry (1995) concur that the empirical work in finance education relating learning (in their study, learning strategies) and academic performance is sparse. Their study found learning strategies (e.g., time, study, effort) and motivational factors (e.g., goal orientations, text anxiety, self-efficacy) in combination with aptitude variables explained over half the variance in academic performance in a finance class. However, a few studies have found a link between learning styles and success in business classes. Controlling for GPA, aptitude, and motivation, Togo and Baldwin (1990) found that students with a convergent learning style, compared to nonconvergent, performed better in a financial accounting course. Similarly, Carthey (1993) examined a group of students enrolled in Intermediate Accounting, Principles of Economics, Business Law, and Principles of Management courses. He found that students who had a predominantly convergent learning style performed better (measured as the average final grade in the courses) compared to the other learning styles. Compared to students who received higher average grades, divergers had the weakest performance.

These findings suggest that students who effectively acquire the concepts and skills to be successful in financial management may also demonstrate a specific learning style as described by Kolb's LSI. In this study we examined whether learning style is predictive of academic success in an individual financial management course, while accounting for several demographic, academic, and time use factors.

3. Method

This study is based on data from 419 students enrolled in four introductory undergraduate family financial management courses at a large midwestern university. The sample was composed of predominantly white students (88%) between the ages of 18 and 57. Charac-

Table 1
 Characteristics of students by learning styles

Variable	All	Diverger	Assimilator	Converger	Accommodator	<i>p</i> -value ^a
Number of students	419	186	55	37	141	0.000
Average class grade	763	755	772	770	768	0.757
Demographic						
Average age	22.6	22.2	22.0	23.0	23.4	0.077
Percentage of male students	47%	42%	41%	57%	52%	0.185
Race: percent non-white	11.6%	14.5%	10.9%	8.1%	9.2%	0.429
Mother attended college	60%	62%	58%	54%	60%	0.792
Father attended college	68%	68%	73%	75%	63%	0.384
Academic						
Total credit hours	137	135	131	141	141	0.087
Percentage with low GPA	22%	23%	24%	16%	23%	0.833
Percentage with high GPA	24%	23%	24%	27%	26%	0.862
Percentage in major	41%	38%	42%	49%	41%	0.682
Required course	79%	76%	72%	73%	86%	0.097
Term 1	25%	24%	22%	27%	27%	0.840
Term 2	24%	27%	22%	19%	21%	0.487
Term 3	18%	19%	29%	23%	14%	0.083
Term 4	32%	29%	27%	33%	38%	0.341
Time-Use						
Average hours employed	16.6	16.1	15.3	21.9	16.7	0.108
Average credit hours this term	15.1	15.3	15.2	13.5	15.1	0.505

^a For discrete variables, values were derived from Chi-Square tests. For continuous variables, *F*-values were derived from one-way analysis of variance.

teristics of the sample are outlined by learning style in Table 1. Additionally, *p*-values for tests of significance between learning styles and participant characteristics are included in Table 1. A one-page questionnaire that included Kolb's LSI along with demographic, academic and time-use questions was administered along with a scheduled quiz. Instructions regarding Kolb's LSI were explained to the class once the quiz was distributed. Students completed the questionnaire as part of the class quiz but no credit was earned for completion and no penalty given to students choosing not to participate.

3.1. Measures

3.1.1. Educational outcome

The dependent variable of interest, student educational outcome, was measured by performance in the course, indicated by the total points earned in the class. Total points as a continuous variable was preferred to categorizing the dependent variable by grade received. Total points attainable were 1000. The point range among the sample of 419 students was from 90 to 1000. The mean of total points for the class was 763, with students on average earning a C for the class. A significance test revealed no differences in grade by type of learning style.

3.1.2. Learning style

Used in over 150 studies, Kolb's Learning Style Inventory was the instrument used to measure student learning style. Besides its strong theoretical foundation, the practical usage of the inventory was preferred, as it is short and easy to administer and score. Kolb's LSI describes four styles of learning based on a ranking by students of nine sets of four words. Each word describes the student's preferences for a learning style, with a four representing the most preferred and a one the least preferred. For example, a set of words from the LSI is "intuitive," "productive," "logical," and "questioning." Scores from summing the ranks of six words are assigned for each of the subscales (CE, RO, AC, AE). The scores are plotted along two dimensions identifying a person as an accommodator, diverger, assimilator, or converger. The instrument has established validity, yet has come under some criticism for its reliability and stability (Atkinson, 1991). Specifically, Kolb (1976) established convergent validity among the four subscales scores, represented by the correlations between the words making up the four subscales and the total score (correlations ranged from 0.46 to 0.67). Additionally, studies have estimated the split-half reliability with a range of 0.37 to 0.81 (Carrier & Melvin, 1982; Kolb, 1976). The split-half reliability coefficients for our sample were 0.73 (AE-RO) and 0.61 (AC-CE), well within the range of previous studies using this instrument.

The breakdown of learning style categories did not follow the usual prediction by Kolb. His research classified 25% of students as accommodators, 25% as divergers, 17% as convergers, and 33% as assimilators. Interestingly, assimilators, predicted to be almost a third of the class, consisted of only 13% of the sample whereas a majority of participants were accommodators or divergers (34% and 44%, respectively). Only a small percentage of the financial management students were convergers (9%). This distribution of learning styles is not a complete surprise given the similarity between the disciplines of family financial management and business, and Kolb's (1981) previous finding that accommodators majored in business more often than any other major.

3.1.3. Demographic variables

Five variables measuring individual and background characteristics of participants were introduced as controls. Previous studies have found age, gender, race, and parents' education to influence academic achievement (Bellico, 1972; Borde, Byrd, & Modani, 1998; Mutchler, Turner, & Williams, 1987; Sewell & Shaw, 1968; Simpson & Sumrall, 1979). Most instructors will agree that older students are usually better personal financial management students, given their past experiences with many of the topics and tools. Studies support this notion with older students performing better in a business finance course (Simpson & Sumrall, 1979). Findings regarding gender were conflicting, with females performing better than males in an accounting class (Mutchler et al., 1987) and males outperforming females in a finance class (Borde et al., 1998). Several studies have examined how parents' education level affects academic achievement of college students. Sewell and Shaw (1968), in a landmark study, found that the higher the parents' educational level the greater the success and graduation rate of college students. Thus, it was hypothesized that greater levels of parent educational achievement would be positively related to performance in the course. Overall, it was hypothesized that older students with parents who had more formal education

would perform better in the financial management class. The direction of race and gender were not predicted.

The questionnaire asked participants their age, gender, race, and their mother and father's educational level. For data analysis, student age was input directly and a dummy variable was used for gender (1 = male, 0 = female), race (1 = nonwhite, 0 = white), and mother and father's education level (1 = attended college, 0 = did not attend college). The average age was 22.6 years, 47% of the sample was male, and 12% were nonwhite. Over 60% of the participants had a mother with some college education, whereas 68% had a father with some college education. Significance tests revealed no differences in the proportion of students falling into a particular learning style by age, gender, race, and parent education.

3.1.4. Academic variables

Several academic factors were included in the model as possible predictors of student performance in the individual financial management classes.

3.1.5. Credit hours

It was hypothesized that students who had a greater number of overall credit hours would perform better in the class. Students indicated the total number of credit hours they had earned to date. Approximately 191 credits are required for graduation, the sample average was 137, indicating that the average student held junior or early senior status. A difference test approached significance (0.09 level of significance) for number of credit hours by learning style, with assimilators reporting somewhat fewer total credit hours.

3.1.6. Grade point average

Previous academic performance, measured as grade point average, should predict current performance in the course. Studies have established that previous student academic achievement predicts future performance (Astin, 1971; Eskew & Faley, 1988). For example, past academic performance was a predictor of current performance in an accounting course (Eskew & Faley, 1988), an economics course (Bellico, 1972) and a finance course (Sachdeva & Sterk, 1982). Students in the current sample were given a range to select from for their GPA. The ranges were collapsed into three categories representing high, low, and middle grade point averages. Low GPAs, 22% of the sample, included students with below a 2.3 GPA on the four-point university scale. High GPAs consisted of 24% of the sample and included students with at least a 3.3 GPA. There were no significant differences in the distribution of low and high GPA students among learning styles.

3.1.7. Major

The decided major of the participant was thought to impact course performance. Those students who are majoring in personal financial management have self-selected, possibly identifying a greater interest and motivation in the course content. Previous studies have found that students who declared their major performed better than students who had not established their academic goal or occupational choice (Lavin, 1965). Further, students

majoring in finance outperformed nonmajors in a business finance class (Simpson & Sumrall, 1979). Students wrote in their major and were grouped into family financial management majors (1) and nonmajors (0). Nearly 41% of the sample was comprised of family financial management majors. There were no significant differences between decided major and learning style type.

3.1.8. Course requirement

Students who were in the course as an elective may have a different motivational level than those in the course because it is required in a major or program of study. Students enrolled as an elective presumably hope to attain useful skills to be applied to their own personal financial situation. Reasoning for the inclusion of whether the course was required is somewhat different than whether the student was simply a declared family financial management major. Several majors require this course in individual financial management. Students selected whether they were taking the course as a fulfillment of a general education curriculum requirement (coded as 1), as a major requirement (coded as 1), or as an elective (coded as 0). Nearly 80% of the class took the course to fulfill some sort of requirement in a degree program. A difference test approached significance (0.10 level of significance) for the proportion of students taking the class as a requirement across learning styles with the highest proportion of students required to take the class being accommodators.

3.1.9. Term

Students were exposed to a variety of instructional methods and activities depending on which term they were enrolled in the course (see Appendix for details on instructional methods by course term). The sample is comprised of students enrolled in four separate offerings of the same introductory family financial management course with roughly 25% of the sample coming from each of four terms when the course was offered. The same instructor taught all four terms of the financial management course, increasing the reliability of the study, yet reducing the generalizability of the findings. Studies have found teaching style to be associated with academic outcome (Felder, 1993), in this case, teaching style was controlled. Another factor impacting educational outcome is the availability of instructional technology. Courses taught in earlier terms did not draw material from a course website. Students enrolled in later courses (terms 3 and 4) could access lecture notes, problem sets, and quiz answers from the course website. A previous study found that educational outcome was negatively impacted by the availability of lecture notes, with students who missed lecture and substituted accessible lecture notes not performing as well (Kelley, 1975). In term 2, the homework assignments changed from optional, not graded, to required and graded exercises. Other significant differences between terms included the addition of a personal financial portfolio in term 2, which may have led to greater personal involvement with the course material. By term 3 it was thought that learning from personal experience through the portfolio outweighed the effectiveness of Wall Street Journal reading assignments, and this assignment was dropped. Also in term 3 the number of applied math problems given as required homework was increased. Closed book quizzes were added in term 2 as a means of

enforcing reading assignments. Given the significant progression and development in the course, the term factor should make a difference in educational outcome in the course.

3.1.10. Time use variables

The amount of time available to commit to the personal financial management course should impact educational outcome. Students who devote greater amounts of time to outside employment, other university courses, and organizational activities should have less time to spend on the financial management course. Part-time employment has been negatively correlated with GPA (Barone, 1993) and students with fewer employment commitments have been shown to perform better in business finance classes (Borde et al., 1998; Simpson & Sumrall, 1979).

Students indicated their total hours of weekly paid employment; the number was input into the learning model directly. The average weekly employment was 16.67 hours. The number of credit hours taken during the term they were enrolled in the family financial management class was also directly input, with students taking an average 15 credit hours for the quarter. There were no significant differences in the number of hours employed or the number of credit hours taken for the term between the four learning styles.

4. Analysis

Referring to Table 1 and the descriptive breakdown by learning style, the most striking result is the number of students classified as divergers and accommodators. This clustering within these learning styles implies that most students in the family financial management course grasp information best through concrete experience. A full 78% of the students were classified as either a diverger or accommodator. Further differences between learning styles were apparent with respect to gender, as male students in the individual financial management class tended to identify more frequently as convergers or accommodators. Thus males preferred active experimentation in the information transforming process. Convergers were also more likely to be family financial management majors. Equally surprising was the fact that average grades did not vary across learning style.

Ordinary least squares regression was used to analyze the independent relationship between educational outcome and the independent variables measuring demographics, academic, learning style, and time-use characteristics. The regression model was:

$$\text{Education Outcome} = \alpha + \beta_1 (\text{age}) + \beta_2 (\text{gender}) + \beta_3 (\text{race}) + \beta_4 (\text{mother's education}) + \beta_5 (\text{father's education}) + \beta_6 (\text{total credit hours}) + \beta_7 (\text{low GPA}) + \beta_8 (\text{high GPA}) + \beta_9 (\text{major}) + \beta_{10} (\text{required class}) + \beta_{11} (\text{term 1}) + \beta_{12} (\text{term 2}) + \beta_{13} (\text{term 3}) + \beta_{14} (\text{diverger}) + \beta_{15} (\text{converger}) + \beta_{16} (\text{assimilator}) + \beta_{17} (\text{hours employed}) + \beta_{18} (\text{credit hours this term}) + e \quad (1)$$

Table 2 presents the OLS regression results. The adjusted r-square of 0.42 implies that demographic, academic, learning style, and time use variables explained a significant amount of variance in grades. Pair-wise correlations between explanatory variables were generally low, with only a significant correlation found between mother and father's education. When only one measure of parental education was included in the model the results were not

Table 2
Demographic, academic, learning style, and time-use variables regressed on course performance

Variable	Coefficient	Standard error	<i>t</i> -ratio	<i>p</i> -value
Demographic				
Age	0.51	1.30	0.39	0.70
Gender	13.43	11.19	1.20	0.23
Race	−7.98	16.55	−0.48	0.63
Mother's education	5.88	12.08	0.49	0.63
Father's education	4.39	12.68	0.35	0.73
Academic				
Total credit hours	0.14	0.13	1.09	0.28
Low GPA	−31.86	13.28	−2.4	0.01
High GPA	97.82	13.59	7.20	0.01
Major	42.66	11.67	3.66	0.01
Required class	−5.08	13.54	−0.38	0.71
Term 1	−160.43	14.30	−11.22	0.01
Term 2	5.82	14.45	0.40	0.69
Term 3	−2.24	15.38	−0.15	0.88
Learning style				
Diverger	−7.07	11.99	−0.59	0.56
Converger	−14.03	19.66	−0.71	0.81
Assimilator	4.96	17.00	0.29	0.77
Time-use				
Hours employed	1.15	0.41	2.80	0.01
Credit hours this term	−3.29	1.49	−2.21	0.03
Constant	763.59	48.44	15.76	0.01
Adj R-square	.42			

significantly different from those reported in Table 2. As a further test for the presence of multicollinearity the variance inflation factor was calculated for each independent variable. Again, the presence of multicollinearity was not detected.

With respect to independent factors impacting learning outcome, academic and time-use variables appeared to contribute to the variance in grades, while demographic and learning style variables did not appear to explain differences in course performance. Specifically, students with lower GPAs tended to perform almost 32 points below the average GPA student, whereas students with higher GPAs earned nearly 98 more points (almost one full letter-grade) than students with average grades. Family financial management majors earned nearly 43 more points out of 1000 than their nonmajor counterparts. The strongest predictor of grades in the model was the term during which the course was taken. Students who took the course during the first term of observation scored much lower than students taking the course during the fourth term. This is likely attributable to two factors, i) the instructor was teaching this course for the first time at this university, and ii) somewhat different teaching methods were employed each term. While the basic content, text, and examination methods were nearly identical across terms, several assignments and activities were adjusted between terms. For example, group problem solving sessions were only used in term 2 and homework problems were optional and not graded in term 1.

Hours of employment directly related to course outcome with each hour of additional

employment adding 1.15 points to the average course grade. Higher credit loads appeared to detract from academic performance as each additional credit hour correlated to a 3.3 point drop in the average student's final grade.

5. Discussion and implications for instruction

Unlike previous studies that have found age, gender, race, and parents' education impacting academic achievement in college courses (Bellico, 1972; Borde et al., 1998; Mutchler, Turner, & Williams, 1987; Sewell & Shaw, 1968; Simpson & Sumrall, 1979), our study did not find student characteristics to be a strong predictor of grades in the individual financial management class. We anticipated older students, and students with parents who had higher levels of education to perform better; this hypothesis was not supported. Though learning style was not a significant predictor of performance in this class, it was observed that males were more prevalent in the converger and accommodator learning style, implying that they may benefit from activities that stress experimentation and "hands-on" problem solving to grasp individual financial management information.

Interesting findings were brought to light with regard to academic predictors, having implications for instructors of similar financial management classes. Regression results clearly showed that students who reported a low GPA did not perform as well in the class, whereas students with a high GPA outperformed average and low GPA students. While this comes as no surprise, instructors could take proactive measures toward the "at-risk" group. For example, some students may lack the prerequisite knowledge necessary to succeed in an individual financial management course, therefore, additional study sessions or tutor hours could be extended to these individuals who have under performed in previous courses. Other students may lack the effective and efficient study strategies to succeed in academic settings, thus time use and study recommendations specific to the financial management course could improve student performance.

There also was a strong tendency for family financial management majors to outperform the rest of the class. Motivation and inherent interest in the topics are the likely explanations for this result. An instructor could use motivated majors effectively in class if group activities and assignments facilitated communication between majors and nonmajors. Perhaps identifying majors as group leaders in team building exercises, allowing the leaders to exhibit their connection and passion for the subject matter.

The most significant predictor of outcome in the individual financial management course was term during which the course was taken. Given the significant changes which took place at the end of the first term (described above and outlined in detail in the Appendix) it was not surprising to find that grades improved after this first offering of the course. Apart from the fact that it was the first time the instructor had taught the course, the addition of required homework problems, a personal financial portfolio, and closed book quizzes, all had a significant positive impact on learning outcomes.

Perhaps the most striking result from the analysis was that learning style had no impact on educational outcome in the individual financial management course. There are two plausible explanations for this finding. First, learning style may not impact student perfor-

mance in individual financial management classes. This being the case, then instructors should not evaluate student learning style and tailor assignments to the distribution of learners in a given class. However, the second plausible explanation for finding no relationship between learning style and success in this course could result from the fact that the instructional tools used in this course were equally appealing to all learning styles.

Students were given the option to complete suggested assignments, both for credit and noncredit, to enhance their learning. Most assignments were to be completed outside of class, involving methods of self-discovery and independent study. However, the course also involved methods catering to a learner's preference for concrete experience and active experimentation. In fact, the two-hour class over the four terms largely consisted of information lectures, best suited for assimilators and their tendency toward reflective observation and abstract conceptualization. During the lectures, significant time was spent going over applied problems in family finance, a technique best suited for a converger's preference for active experimentation and abstract conceptualization. It could be this tendency toward appealing to multiple learning styles that explains the resulting even distribution of academic performance across learning styles. Even if this is not the case, the desirable result from both the instructor and student perspective is no noticeable significant differences across learning styles.

Despite learning style not being a determinant of educational outcome in the financial management classes, other important implications for the financial educator emerge. With nearly 80% of the sample demonstrating a preference for grasping information through concrete experience, teaching techniques such as class discussions, brainstorming and group activities, simulations, debates, interviewing, practicums or internships, and independent study may generate the most positive classroom environment.

Equally important in this case is the fact that only 13% of the sample were classified as learning best through assimilative methods. Assimilative learners learn best through a process of abstract conceptualization and reflective observation which is inherent in information lectures, abstract independent problem solving, theoretical analysis, and conceptual papers, techniques commonly used to teach individual financial management. This can be interpreted as weak evidence that more "traditional" teaching techniques may not be meeting the preferences of the majority of family financial management students. Continued movement toward techniques of self discovery and group interaction seems to be in the students' best interest.

If the distribution of students over learning styles is similar in other universities, then moving instruction away from abstract conceptualization and toward active experimentation is warranted. However, instructors need to determine that their students are similar to those in this sample. The Kolb Learning Style Inventory used in this analysis is easy to administer and could be used to make this determination.

Studies on effective teaching support the notion that the most important element effecting learning outcome are the class activities/assignments required of the student. A range of instructional methods is available to the financial management instructor. Immediate involvement in the learning experience works effectively for students responding to concrete experience; active experimentation learners prefer the hands on approach to learning. For these types of learners, Felder (1993) suggested active student participation through encour-

aged or mandated cooperation (team-based) on assignments both in and outside class. Students responding to abstract conceptualization prefer to take a rational and logical approach; students responding to reflective observation prefer to think about the information/situation from many perspectives. For these students, Felder (1993) suggested allowing students class time to think about the material being presented.

The impact of time-use on educational outcome also has important implications for instructors of financial management. Employment and academics appear to complement each other. Assuming that employment hours were spent in work related to family financial management, then internships may provide the fertile ground for active experimentation with the material learned in class. This implies that instructors need to be linked to the employment and internship market to provide these complementary experiences. In this study we don't know specifically what employment environment students are engaged in, thus strong conclusions cannot be drawn. On the other hand, students who are working may only be gaining tangible financial experience by being involved in the "personal finance of employment" (e.g., collecting a paycheck, observing withholdings, managing income, making retirement plan decisions). Therefore work experience alone could be providing a means of active experimentation with personal financial management concepts and skills. Additionally, there may be some self-selection bias present in this finding, as it is more likely that the "highly qualified" seek the challenge of employment demands in conjunction with taking college courses.

Heavy course loads also identify students at risk of under performing. This too is an easy factor for instructors to identify as students enter the class. Students with heavy loads could be advised to reduce other outside commitments or reduce other course commitments when enrolled in rigorous family financial management classes.

6. Conclusions

The academic performance of 419 undergraduate students in an individual financial management class was evaluated in light of their learning style, demographic background, academic history and time allocation. Academic history and time use variables proved to be the only significant predictors of grades in the course. Students performing well in other courses also performed well in the financial management course. Employed students performed better in the class whereas students taking heavy course loads received lower grades in the class.

Student learning style, as measured by Kolb's Learning Style Inventory, was not a strong predictor of success in this financial management class, and it appears that no single type of learner best grasps financial management concepts. Thus, within the financial management class instructors should consider using a range of instructional methods to ensure equal appeal to all types of learners.

Appendix

Instructional activities by term^a

Instructional activities	Term			
	1	2	3	4
<i>Lecture:</i>	X	X	X	X
<i>Lecture Notes Posted on Course Website</i>	–	–	X	X
<i>Personal Financial Portfolio:</i> Students develop and compile important documents related to their personal finances. Includes stating financial goals, preparing income and expense statement and balance sheet, calculating financial ratios, preparing tax form, obtaining credit report, summarizing terms of insurance policies, obtaining prospectus for 3 mutual funds, and preparing a retirement plan worksheet.	–	X	X	X
<i>Wall Street Journal Reports:</i> Students maintain daily, reflective, journal writing about personal finance topics and movement in interest rates or stock market.	X	O	–	–
<i>Quizzes:</i> Students take fact based quizzes, closed note, closed book.	–	X	X	X
<i>Exams:</i> Students answer problem solving or case study evaluation questions during open note, open book exams.	X	X	X	X
<i>Homework Problems:</i> Financial math questions, small case study analysis.	O	X	X	X
<i>In-Class Group Discussion and Problem Solving</i>	–	X	–	–
<i>Guest Speakers</i>	X	X	X	X
<i>Course Web-Page:</i> Students could access on-line syllabi, lecture notes, homework answers, exam and quiz answers. Webpage address: http://www.hec.ohio-state.edu/cts/sp260/index.htm	–	–	X	X

^a Note. X = method was employed; O = optional for student.

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