

## Chapter 5

### SUMMARY, CONCLUSIONS, AND IMPLICATIONS

Marshall (1991) found that slow learners or poor achievers had learning preferences that were not being supported within the traditional schooling structure. Altering educational conditions, however, to meet learning style preferences could produce statistically significant improvements in grades and attitudes (Dunn, Beaudry, & Klavis, 1989). By expanding their teaching styles, instructors can support opportunities for students with different learning styles to increase their learning (Friedman & Alley, 1984). Gregorc and Ward (1977) recommended that instructors identify the learning styles of the students, identify their teaching styles, and then vary their teaching methods to meet the range of learner preferences. Hyman and Rosoff (1985) contended that matching learning style with teaching style will augment achievement. According to Henson and Borthwick (1984) learners have their own preferred learning styles, and instructors have a responsibility for gearing up their teaching styles to fit the learning style of the learners.

Various researchers have suggested that matching instructors' preferred teaching style to students' preferred learning styles will produce higher academic success as measured by final exam scores (Van Vuren, 1992; Zippert, 1985) and course grades (Matthews, 1995; Raines, 1976; Hunter, 1979; Carthey, 1993; Miglietti, 1994). However, other researchers have contended that there is no significant relationship between style match and academic success (Hunter, 1979; Charkins, O'Toole, Wetzel, 1985; Campbell, 1989; Battle, 1982; Lyon, 1991; Scerba, 1979). Most researchers agree that further study is needed in the area of identifying learning styles, teaching styles, and the significance of a match between the two and student academic success.

This study added to the growing body of research by investigating the assumption that learning style and teaching style match augments student achievement as indicated by course grades and final exam scores. Also, student perceptions of instructor effectiveness and style match was investigated. This chapter presents a summary of the study, including procedures used and major findings, discussion, conclusions, and implications of the study.

#### Summary

This study was designed to determine whether a match between instructors' teaching styles and students' learning styles would foster student success as evidenced by higher course grades and final exam scores. Furthermore, student evaluations of instructors were examined to determine whether a match between instructors' teaching styles and students' learning styles would yield more positive evaluations of instructor effectiveness.

Educational institutions are being asked to provide proof that students are receiving a quality education, one that will prepare them to compete not only nationally but globally. Political leaders, as well as national, state, and local government agencies, and the general public, have placed great emphasis on education reform. Educators recognize the need to continuously search for ways to enhance student achievement. This

research examined the theory that successful student achievement can be attributed, in part, to matching student learning styles with instructor teaching styles.

This study sought answers to six research questions:

1. What are the teaching style profiles, including typologies, of the business instructors as measured by the Canfield Instructional Styles Inventory?
2. What are the learning style profiles, including typologies, of the students in business classes as measured by the Canfield Learning Styles Inventory?
3. What is the percentage of match of teaching styles and learning style across classes of business instructors?
4. What is the relationship between students' success as indicated by course grades and a match between their learning styles and the instructors' teaching style?
5. What is the relationship between students' success as indicated by final exam scores and a match between their learning styles and the instructor's' teaching style?
6. What is the relationship between students' evaluations of their instructors and a match between teaching style and learning style?

#### Procedures

Five business instructors and 99 students from two community colleges in Southwestern Virginia participated in the study. The ages of the student participants ranged from 18 to 62. The average age was 35. Fifty-four percent of the participants were required to take the business course for their major. Forty-five percent took the business course as an elective. The specific subject areas included in this study were keyboarding, word processing, machine transcription, desktop publishing, and introduction to computers. The non-probability, incidental sampling technique was utilized.

The researcher presented the topic to the business instructors by telephone and explained the purposes of the study and secured their approval to use specific subject areas to collect data for the research. A human subjects clearance form was filed and approved by the Department of Sponsored Programs at Virginia Tech. A pilot study was conducted with one community college instructor and five students. The results from the pilot study indicated that no changes in the directions or procedures were necessary.

The researcher met with the business instructors and their students and explained the purposes of the study as well as the instruments used in the study. Both the instructor and the students completed the inventories simultaneously. The researcher collected the inventories, human subjects permission forms, and instructor evaluation forms and checked them to ensure they were completed as directed. Instructors were provided with a form to record the students' course grades, final exam scores, and grade point averages (GPA). Only the last four digits of each student's social security number were used to identify each student ensuring that their identity remained anonymous to the researcher.

Descriptive statistics were employed to answer questions one and two. The Canfield Learning Styles Inventory and the Canfield Instructional Styles Inventory were used to obtain the teaching styles of the business instructors and the learning styles of their students. The Canfield Learning Styles Inventory is composed of 30 items, each of which has four corresponding choices. Students ranked these choices in the order that best described their preferences on a scale of 1 to 4 with 1 being their most preferred

choice and 4 being their least preferred choice. On average, it took approximately 30 minutes for the students to complete the inventory. The Canfield Instructional Styles Inventory is composed of 25 items that assess 21 different aspects of the teaching-learning experience. Each of these items has four corresponding choices. Instructors ranked their choices in the order that best described their preferences on a scale of 1 to 4 with 1 being their most preferred choice and 4 being their least preferred choice. The average time for the instructors to complete this inventory was approximately 25 minutes.

Both inventories were hand-scored by the researcher. Once raw scores were obtained from the inventories, they were converted using Canfield's (standardized profile form) to obtain t-scores and percentile scores. A typology was created using the t-scores. The typology is a combination of individual learning and instructional styles scales which is used to identify learners and instructors by type.

**Research Question One: What are the teaching style profiles, including typologies, of the business instructors as measured by the Canfield Instructional Styles Inventory?**

To answer this question, instructors completed the Canfield Instructional Styles Inventory. The inventory scores were totaled to obtain raw scores for each scale. Group means (representative of the raw scores for the group of business instructors in the study) were calculated for each scale.

The lowest score represented the most preferred scale and the highest score represented the least preferred scale. Additionally, instructor typologies were obtained by correlating information from 10 different Instructional Styles Inventory scales. Instructors were classified into one of nine categories within the Instructor Typology. The percentages of business instructors in each of the categories within the Instructor Typology were calculated by dividing the number of participants who preferred a category by the total number of participants.

Results revealed that the most preferred scales identified by study participants are **Organization, People, Direct Experience, and A-Influence**. The least preferred scales are **Competition, Numeric, Reading, and D-Influence**. Instructor participants are likely to favor clearly organized work, working with people, providing hands-on activities, providing logically organized coursework that incorporates clearly defined, meaningful assignments, and providing real-life activities that involve others. They feel strongly that instruction methods affect learning and try to vary their approach to reach all students. However, they are not likely to allow students to work independently, choosing their own objectives and deciding how they would accomplish their goals. Opportunities are not likely to be provided for students to compete or to be compared with each other. The instructor participants are not likely to enjoy working with quantitative or math-related activities, nor are they likely to favor providing supplementary reading texts such as pamphlets or articles as tools to accomplish instruction.

A chi square test was run to determine if there were significant differences between the expected and actual categories of the Instructor Typology. The expected categories were derived based on a sample of 200 instructors from which the typology

was created. The actual categories were derived based on the 5 instructor participants in this study. A chi square outcome comparing the proportion of study participants to the normed group was .333 for expected. The goodness of fit chi square value with four degrees of freedom for actual 2.667. Neither chi square value was significant at the .05 level.

**Research Question Two: What are the learning style profiles, including typologies, of the students in business classes as measured by the Canfield Learning Styles Inventory?**

Students completed the Canfield Learning Styles Inventory. The inventory scores were totaled for each scale to obtain raw scores. Group means were calculated for each scale. The lowest score represented the most preferred scale. The highest score represented the least preferred scale within the category. Additionally, learner typologies were obtained by correlating information from 10 different Learning Style Inventory scales. Students were classified into nine categories within the Learner Typology. The percentage of students in each of these categories was calculated. The percent of participants who preferred a category was obtained by dividing the number of participants who preferred a category by the total number of participants.

The most preferred scales identified by student participants in this study are **Organization, People, Direct Experience,** and **B-Expectation**. The least preferred scales are **Independence, Numeric, Reading,** and **D-Expectation**. The participants are likely to enjoy activities that require working with others. They favor receiving clearly organized, meaningful assignments that require hands-on performance. Performance of these participants is expected to be at an above-average level in a learning situation. These participants are not likely to favor working alone or independently, determining their own plan of study, working with numbers, or solving mathematical problems. They are not likely to favor examining pamphlets, articles, books, or magazines as supplementary information.

A chi square test was run to determine if there were significant differences between the expected and actual categories of the Learner Typology. A chi square outcome comparing the proportion of study participants to the normed group was 2.111 for expected. The goodness of fit chi square value with four degrees of freedom for actual was 2.333. Neither chi square value was significant at the .05 level.

**Research Question Three: What is the percentage of match of teaching styles and learning styles across classes of business instructors?**

The percent of match of teaching styles to student learning styles was identified. This was accomplished by determining the teaching styles of the instructors and the learning styles of their students as measured by the Canfield Learning Styles Inventory and the Canfield Instructional Styles Inventory. Learner and instructor typologies were created based on the raw scores from the inventories. Style match was then determined based on the nine categories within the typology. To determine the percent of match, the number of instructors and students who matched were divided by the total class size and multiplied by 100. To determine the degree of match and mismatch, squares within a

3 x 3 typology grid were counted either vertically or horizontally (but not diagonally) through the boxes, counting the number of boxes you had to move through to get from the instructor's cell to the student's cell. The degree of match or mismatch by distances of 0 and 1 reflect an adequate fit between the instructor and the student. Distances of 2 and 3 reflect a moderate mismatch. A distance of 4 indicates a substantial mismatch.

A total of 36% of the 99 students matched the instructors' teaching style. Instructor 5 had the highest percent match with 8 out of 10 students, 80% matching. Instructor 1 had the lowest percent match with 2 out of 17 students, 12% matching.

**Research Question Four: What is the relationship between students' success as indicated by course grades and a match between their learning styles and the instructors' teaching style?**

Students were blocked into two groups: high achievers, GPA of 2.5 to 4.0 on a 4.0 scale, and low achievers, GPA of 1.0 to 2.4. The two categories were divided relative to match. Student participants whose learning style matched the instructors teaching style were designated "1" and those who mismatched were designated "0". The two independent variables were the two GPA categories and match or non-match of learning style and teaching style. The dependent variable was course grade. A comparison of students' course grade across match and non-match was made using analysis of variance to determine if there was a significant difference between students who matched their instructors and those who did not match. The course grade conversion was A = 5, B = 4, C = 3, D = 2, and F = 1.

The F-ratio was .228, the level of significance was .634. No significant relationship was found between students' success as indicated by course grades and a match between their learning styles and the instructors' teaching styles as measured by the Canfield Learning Styles Inventory. The main effect of GPA is significant at the .003 level with an F-ratio of 9.533.

**Research Question Five: What is the relationship between students' success as indicated by final exam scores and a match between their learning styles and the instructors' teaching style?**

Students were blocked into two groups: high achievers, GPA of 2.5 to 4.0 on a 4.0 scale, and low achievers, GPA of 1.0 to 2.4. Each of these were divided relative to match or non-match of teaching style. The two independent variables were the two GPA categories and match or non-match of learning style and teaching style. The dependent variable was final exam scores. A comparison of the mean final exam scores across match and non-match was made using analysis of variance. The exam score conversion was A = 12, A- = 11, B+ = 10, B = 9, B- = 8, C+ = 7, C = 6, C- = 5, D+ = 4, D = 3, D- = 2, and F = 1.

The F-ratio was .052. The level of significance was .147. There was no significant relationship between students' success as indicated by final exam scores and a match between their learning styles and the instructors' teaching style. Final exam grades were significantly different at the .014 level for GPA.

**Research Question Six: What is the relationship between students evaluations of their instructors and a match between teaching style and learning style?**

Students were blocked into two groups: high achievers, GPA of 2.5 to 4.0 on a 4.0 scale, and low achievers, GPA of 1.0 to 2.4. Each of these is divided relative to match or non-match of learning style and teaching style. The two independent variables were the two GPA categories and match or non-match of learning style and teaching style. The dependent variable was rating of instructors. Analysis of variance was used to compare instructor ratings across match and non-match. The instructor evaluation conversion was excellent = 5, very good = 4, good = 3, Fair = 2, and poor = 1.

The F-ratio was 2.135. The level of significance was .147. There was no significant relationship between students' evaluations of their instructors and a match between teaching styles and learning styles as measured by the Canfield Instructional Styles Inventory and the Canfield Learning Styles Inventory. However, instructor evaluations were significant at the .003 level for GPA.

#### Discussion

The participants in this study were all within the moderate ranges on the scales as defined by the Canfield instruments. There were no instructor or student participants in the extreme areas on the scales. Since the average age of the student participants was 35, this may be due in part to the fact that learning styles have been mediated as a result of life experiences.

Literature suggests that learning styles and teaching styles can be identified through use of numerous instruments. This study found that learning styles and teaching styles were identifiable as measured by the Canfield Learning Styles Inventory and the Canfield Instructional Styles Inventory. Through use of Canfield's typologies, the degree of match or mismatch was identified between students and instructors.

#### Conclusions

- The following conclusions were drawn from the findings of this research:
1. The theory established by researchers that style match will produce student success as measured by final exam scores (Van Vuren, 1992; Zippert, 1985) and course grades (Matthews, 1995; Raines, 1976; Hunter, 1979; Carthey, 1993; Miglietti, 1994) may not be true in all situations. The findings in this study indicated that there was no significant relationship between style match and student achievement for this particular group of participants. For this study, no significant differences were found in course grades and exam scores between students who matched their instructor's style and those who did not.
  2. The theory established by researchers that there is no significant relationship between style match and students' ratings of the instructor (Hunter, 1979; Campbell, 1989) was found to be true for the participants of this study, who were by and large in the moderate ranges on the Canfield Learning Style Inventory. The findings indicated that instructor evaluations for students of this type are not influenced by their learning styles. Thus, instructors seeking to improve student evaluations should look to other sources.

3. The lack of significant relationships between a matching of instructor and student styles with the other variables in this study can probably be attributed to the finding that both the instructors and students had style preferences that were in the moderate ranges. Thus, in working with students of this type, instructors can not assume that changing their teaching style to accommodate perceived student learning styles will improve final exam and grade achievement.
4. Instructors of business courses need not be concerned about a match of their teaching style with the students' learning styles provided that their teaching style preference is in the moderate range and also that the students' learning styles preferences are in the moderate range. The findings of this study indicate no relationship between learning styles in moderate ranges and student achievement.
5. As might be expected, grade point average (GPA) relates to course grades, to final exam scores, and to instructor evaluations. Students categorized as high achievers (GPA of 2.5 to 4.0) received higher course grades and final exam scores and gave instructors higher evaluations. Administrators using student instructor evaluations as a basis for assessing effective teaching need to be aware of this finding.

#### Recommendations

This study has generated information that suggests further study of the effects of style match on student achievement is warranted. The following recommendations are made based on the findings and conclusions of this study. Recommendations for both practice and further research are included.

#### Recommendations for Practice

1. Instructors should be aware of their own teaching style and the learning style of their students. If their teaching style and student's learning styles are in the moderate ranges, they should realize that altering their teaching style will not be likely to lead to increases in student achievement.
2. Since students indicated a preference for organization, people, and direct experience, instructors should present well-organized course work, provide meaningful assignments, and provide a logical sequence of real-life, hands-on activities that involve working with others.
3. Instructors should use learning styles assessment to help students with learning disabilities and others who need remediation to achieve greater success.

#### Recommendations for Further Research

1. This study was limited to two community colleges in Southwest Virginia. The population consisted of 99 students and 5 teachers. This study should be replicated in other educational institutions with a larger population to compare with the findings of this study and previous research.
2. The participants in this study were found to have diverse preferred learning styles. A percentage of student participants fell within all nine learning style categories as defined by the Canfield instruments. In order for educators to accommodate diversity of learning styles, additional research is needed on learning style/teaching style.

3. The courses used in this study focused primarily on courses involving the learning of computer applications. Instructor teaching styles may be different for business classes that do not involve total hands-on computer usage. Thus, a similar study should be conducted using other business courses such as office administration, writing for business, introduction to math, editing, and accounting to determine if differences exist in learning styles and teaching styles between content areas. This type of study would assist educators in determining which learning styles and teaching styles aid in student achievement.
4. This study used the Canfield instruments to assess learning and teaching styles. As noted in the review of literature, researchers were divided in their findings as to the effect style match had on student achievement. The researchers used a variety of instruments. Some researchers found that style match had a significant effect on student achievement while others found that there was no significant difference between style match and student achievement. A similar study should be conducted, using the same population, which utilizes the Canfield instruments in conjunction with another appropriate instrument to compare the results of the findings between the two instruments.
5. This study did not focus on extraneous variables. A similar study should be conducted which incorporates social variables, socioeconomic levels, race, and gender to determine if these variables significantly affect style match and student success.
6. The Canfield inventories used in this study are self-report instruments. A study should be conducted to observe teacher styles and see if they match the self-report.

#### Summary

Inquiry into teaching styles and learning styles are considerations for business educators. Research on the implications of teaching style/learning style match are variables that need further study for future planning in the areas of curriculum development. Such study may serve to enhance the teaching and learning process so as to more effectively meet the needs of individual learners.