

Introductory Finance Students' Perceptions of and Reactions to Instructional Rubrics

Dr. Harold B. Tamule, Providence College
Dr. Karen Whelan-Berry, Providence College

ABSTRACT

Our paper is an exploratory study of student perceptions of the use of instructional rubrics in undergraduate introductory finance courses. We first define rubrics and develop the rationale for them in a learning environment. Prior research on rubrics has explored the design of rubrics, their specific contents and students' performance on the rubric. Less research has explored students' perceptions of rubrics, and the courses in which they are used. To fill this gap in prior research, using survey research we focus on students' perceptions of instructional rubrics and how using instructional rubrics impacts students' perceptions of the course, professor, grading and learning. Although our results did not show any statistically significant differences in terms of demographics and students' use of provided rubrics, our results did reveal that the willingness of students to use the course rubrics is associated with their more positive perceptions of the professor and the grading process.

INTRODUCTION

Educational theorists believe that ultimately the truest measure of business students' learning is their ability to engage successfully in meaningful, real-world activity. Such learning means that students are able to apply knowledge, not just demonstrate understanding. In the tripartite world of financial education this suggests that our finance majors are best developed and assessed by allowing them to manage a portion of their college's endowment, running a campus credit union, or starting, adequately financing, and successfully operating a business (Montgomery, 2002). However, practicality often requires that finance students may only play a stock market game, take a personal finance course or analyze an interesting corporate finance case in their required finance course. Moreover, the experience of many business students in the introductory finance course is that their instructors lecture, administer true/false or multiple choice tests, and avoid requiring writing assignments. This approach can result in limited abilities to apply knowledge to real world situations.

Clearly finance instructors are challenged by how to give students more real world and applied performance expectations, assignments, and evaluations. First, a finance instructor must be very clear about primary course learning goals and objectives, and how students should be able to apply knowledge related to those goals and objectives. In addition, the more applied assignments - those that require critical thinking and personal performance, such as real-world problem analysis, historical case analysis, oral presentations, or effectiveness in working with a

local business or in an internship - involve much subjectivity in assessment and grading. Therefore finance instructors need to make what can or may be subjective more objective.

Instructional rubrics provide a way to do so. A rubric is an instructional tool that provides students with the criteria for their work, articulating the differences between various quality levels or grades (Andrade, 2005). Rubrics have become a popular tool for assessment purposes, providing a means of more consistently evaluating student learning across sections and professors of a given course. Rubrics provide a means to clarify what the student is expected to learn and the professor's expectations for students. As business students often find their required finance course challenging, rubrics may provide a way to clarify the most important content and to better focus students' learning. Prior research on rubrics has most frequently explored the design of rubrics, rubrics' specific content, and students' performance on the related assignment or exercise. Minimal research has explored students' perceptions about the use of rubrics in courses and how the use of rubrics impacts students' perceptions of the course, professor, and the grading.

For this exploratory study, we developed and provided rubrics to introductory finance courses to assist students in preparing writing assignments and to focus students' attention on key concepts for tests. At the conclusion of the course we used survey research to study students' perceptions. We first explore students' use of the rubrics provided, and then whether the students' use of the rubrics impacts their perceptions of the course, professor, and the grading. Our results show that students who actually used the available instructional rubrics had more positive perceptions of the professor and the grading. In our discussion we focus on which students were more likely to use the results, how rubrics can positively impact student learning, and how rubrics can impact perceptions of the course.

REVIEW OF RELATED LITERATURE

Rubrics

A rubric is an assessment tool that provides the criteria for student work, and it typically delineates high quality or grade from low (Andrade, 2005), or it may extensively define and described items of earned credit (Arter & McTighe, 2001). Two common types of rubrics are holistic and analytic (Mertler, 2001). Instructors can use holistic rubrics to assess or grade a piece of work overall, with limited assessment of component parts, while an analytic rubric provides a means of assessment individual or component parts of an overall assignment as well as determining the overall assessment or grade (Mertler, 2001; Arter & McTighe, 2001). Holistic rubrics are more suited to assignments in which there is no single definitive, correct answer, in which students may be required to be creative, and for more summative analysis (Mertler, 2001). They are appropriate when the instructor will evaluate one major aspect of the assignment or when the key assessment criterion is to get a "quick snapshot" (Arter & McTighe, 2001). Analytic rubrics are more suited to assignments for which a best or definitive, correct answer exists, in which student creativity would be more limited (Mertler, 2001), or in judging complex assignments with several dimensions or when the professor wants to provide more specific feedback or information to students (Arter & McTighe, 2001). Because analytic rubrics focus on component parts of an assignment, one advantage is the significantly more detailed feedback they can provide to students.

The rubric with which we are concerned is an instructional rubric. The term “instructional rubric” distinguishes rubrics that students might use as part of a course from those that are used purely for assessment. Instructional rubrics may be holistic or analytic, but often are more analytic in nature. Instructional rubrics identify an assignment’s expectations for students, again, specifying levels of quality (Andrade, 2000). Instructional rubrics are also used to provide feedback and or grades to students.

The design of an effective instructional rubric must contain objective task-specific performance criteria rather than judgmental or subjective descriptors (Moskal 2000). Moreover, experienced developers and users of instructional rubrics attempt to avoid excessively general, as well as excessively detailed task-specific performance criteria. Thus, a well-designed instructional rubric does not emphasize and substitute testing mechanics of introductory finance learning goals for the desired learning itself (Popham, 1997). In addition the well-designed instructional rubric is reliable, so any grader would arrive at the same quality assessment of each student’s work as the course’s instructor; and the rubric is also valid, as it actually motivates the correct outcome, i.e., actual learning in contrast to guiding the student through the performance evaluation (Mabry, 1999). Ultimately instructional rubrics that the finance instructor communicates in a timely fashion have the potential to allow students to engage in self-assessment during their preparation and self-direction as they continue their studying for the required assignment. A most desired outcome is that the student will engage in more independent learning and perhaps begin to develop life-long learning behaviors (Hegler, 2003).

Professors and Rubrics

For professors, rubrics are one way of becoming very clear about their own expectations (Andrade, 2000). Rubrics can be used to “clarify learning goals, design instruction that addresses those learning goals, communicate the goals to students, guide our feedback on student progress toward the goals, and judge final products in terms of the degree to which the goals were met,” (Andrade, 2005, page 27). At the same time, rubrics are not completely self-explanatory, so professors must understand themselves and then explain to their students how rubrics are being used. While most professors write feedback on assignments and exercises, such feedback is typically after the fact, and may be ignored by students if they simply look at their grade. When provided prior to an assignment and when used for feedback on that assignment rubrics deliver both guidance and detailed expectations up-front, as well as after the fact and also increase the consistency of grading (Montgomery, 2002).

Students and Rubrics

For students, a learning rubric can be thought of as a matrix of a student’s potential or actual performance or intellectual achievement over certain identifiable task dimensions segmented according to various performance criteria (Allen and Tanner 2006). In other words, such a rubric is a two-dimensional tradeoff of the quantity and the quality of a student’s intellectual performance. As information provided prior to student performance, an instructional rubric communicates to students an instructor’s desired criteria of learning and his/her standards of performance evaluation, and can subsequently be used to give the student feedback on assignments. On an ex-post basis an instructional rubric is a vital aspect of the course’s assessment and on an ex-ante basis may still serve as a valuable source of feedback (Fink 2003).

As yet very little research has examined the attitudes and behaviors of students who have access to instructional rubrics as part of their course experiences. Andrade and Boulay (2003) present evidence that in some circumstances students with rubrics do produce higher quality essays. Furthermore, they identify students' grade history and their scores on aptitude tests as intervening variables that are positively related to subsequent assessment results. Additionally, anecdotal evidence supports the dichotomy of highly motivated students taking an instructional rubric seriously, while less motivated students treat the rubric with disdain (Andrade 2005). This suggests that the attitudes of the affected students regarding an instructional rubric are a force that possibly explains their performance. Given the limited research exploring students' perceptions related to rubrics we engaged in survey research to uncover students' attitudes towards a course using instructional rubrics, their perception of the professor, and their perception of the grading.

METHODOLOGY

We identified the principles of finance course as the ideal opportunity to employ instructional rubrics. For many undergraduate students this class is the only college-level experience with the business discipline of finance. For finance majors, this introductory course provides a vital chance to master the basic concepts, fundamental principles, crucial analytical skills, and methodologies of finance. Any innovation that can improve this student experience should lead to a more valuable college education and possibly to entry-level job market and career advantages.

Prior to the beginning of the semester we developed instructional rubrics, which were more analytic in nature, for the introductory finance course. We developed instructional rubrics for the financial analysis, time value of money, capital budgeting, investment analysis, and finally risk-and-return segments of the course. As examples, we include in Appendix A, instructional rubrics for the basic financial analysis report and for the time value of money exam. As shown in the rubrics, the expectations for the effectiveness of a financial analysis report is comprised of a student's identifying and understanding the economic nature of the firm's business, obtaining appropriate financial data, manipulating such data, clearly reporting the results of such analysis, and his/her presenting their conclusions. The expectations for a student's effective learning of the time value of money is knowledge of the basic equations, facile manipulation of the formulae, and complex usage of the formulae, such as using them in combinations.

We employed instructional rubrics in two sections of introductory finance, one comprised entirely of business majors and the other comprised entirely of non-business majors. The instructional rubrics were presented and discussed in class approximately two weeks before the scheduled assessment exercise. For this study, we used the instructional rubrics as a means of clarifying their expected learning, and emphasized that students should use these rubric as they completed the assignment or prepared for the test. The rubrics were available on the online course management system, and students could access them whenever they wanted.

At the end of the Spring 2010 semester, we administered a survey that gathered anonymous data on student demographics, study and course preparation habits, perceptions of assignments and rubrics, and perceptions of the course and the professor. Our survey consisted of applicable course statements for which the students were asked to identify their level of agreement on a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). We test

the relationships with Somers' d statistic, a nonparametric test of the strength of an independent variable determining a dependent variable without having to assume underlying symmetrical distributions of the data. The Somers' d statistic is appropriate for the ordinal type of data in this study (Zikmund, 1997).

First we solicited a small set of student demographic data to explore whether their background impacted students' willingness to use the course rubrics. Of the thirty four registered students, twenty nine attended class that day and available for the survey. We then asked a series of questions to explore students' perceptions of the rubrics, the course, the professor, and the grading.

Table 1 displays the basic composition of the two sections of the introductory finance students. The classes were approximately evenly divided between males and females, and most of the responding students were either sophomores or juniors. On a five point scale - i.e. 1 = rarely attended to 5 = never missed class - the average response was 4.1, or "rarely missed class". In addition, sixty-two percent of students had received rubrics in other courses.¹

RESULTS AND DISCUSSION

Table 2 provides the analysis in terms of student demographics and self-reported use of the rubrics provided in the course. Table 3 uses the course management software data to provide additional data about use of the rubrics, as we were able to track student access of the rubric files. Most importantly Table 4 provides our analysis of students' use of the rubrics and their perceptions.

Student Use of Rubrics

As shown in Table 2, we did not find any strong statistical differences in terms of demographics and use of rubrics. However, at the 10% significance level are two interesting findings that imply that students with a lower self-reported GPA ($t = -1.75$) were also more likely to use the rubrics and that business majors were more likely to use the rubrics actively than non-business majors ($t = -1.82$). Our findings on GPA do not fully support prior research, as Andrade (2005) found that more motivated students are more active in using rubrics. Interestingly, prior familiarity with rubrics did not necessarily mean that students were more likely to use them in a subsequent course. For the sake of this study, our rubrics informed students of our expectations and provided guidance as students completed assignments or prepared for exams. Our data also show that students were more likely to refer to the rubric while they prepared the assignment, as opposed to checking the completed assignment to the rubric.

While we did not initially develop any testable hypotheses based on each student's personal activity of using the course rubrics, data in Table 3 provides insights into this student activity from the online course management software. To analyze the access tracking data that reports the day when each student opened the rubric file we assigned a value of 0, if the student did not access the file, a value of 1 if the student accessed the file on the day the assignment was due, a value of 2 if the student accessed the file the day prior to the assignment being due, and so on. If a student accessed the instructional rubric file multiple times we count only the first instance. Therefore, we proxy absolute student use of the instructional rubric by referring only to each students' first, or only use of the document. For the business majors section a mean

score of 5.29 for Paper 1 indicates that on average a student whose initial paper was due on a Friday accessed the rubric file on the previous Monday. Further, Table 3 shows that the non-business majors accessed the instructional rubrics sooner than the business majors. A simple t test of the difference between two means is weakly significant at the 10% significance level. This finding is a different dimension of differential use than that statistic reported in Table 2. Finally based on the number of students who did not use the instructional rubric, students were more likely to access the rubric for the analytical essays than those for the in-class exam.

Student Perceptions about the Rubrics, Grading, Professor, and Course

Given that the prior research has not fully explored students' perceptions to instructional rubrics, the primary focus of this exploratory study is to examine the relationship between students' use of the rubrics and the students' perceptions of the grading, course, and the professor. Our independent variable is a summative variable, average-use-of-rubric, created by adding together responses to similar relevant survey statements.² This summative variable included three questions that asked students whether the rubric helped them understand expectations, whether they referred to the rubric as assignments were completed, and whether they checked their assignment to the rubric before submitting it. Our dependent variables are the students' perception of the course, their perception of the instructor, and their perception of the course's grading. We used the individual questions in order to provide more detailed analysis.

Our Table 4 results show students perceptions of the professor, the course grading, and the course itself. We show a general positive relationship between the students' use of the rubric and perceptions of the professor and the grading, and mixed results in terms of perceptions of the course. First, the course use of rubrics positively impacted students' perceptions on the four variables of the professor: his organization; the clarity of his expectations; the provision of sufficient feedback; and, his concern about the students. These perceptions are all significant at the 1% level of significance. Most importantly the highest t statistic of 3.54 is for the clarity of the professor's expectations. This is a very pleasing result which reflects the hypothesized rationale for using instructional rubrics. The rubric use positively impacted the two variables of grading, consistency and fairness, at a statistically significant level. Further, students' use of the rubric was associated with perceiving the course as more intellectually stimulating.

In terms of students' use of rubrics and perceptions related to grading, use of rubrics favorably reflected students' sense that grading was consistent and fair. Especially on assignments that are not strictly quantitative, students often feel grading is subjective. However, as noted in prior research, rubrics mean that professors think carefully about assignment expectations; and so it is logical to find that students who use the provided rubrics perceive the grading as more consistent and fair. Thus, rubrics may be especially helpful on assignments which are more subjective.

Students' use of rubrics also positively impacts their perceptions of the professor, in this instance resulting in students' perception being less negative or moving toward neutral. Rubrics may signal to students that professors have more thoroughly thought about their course, assignments, and expectations, that they are clear about what is most important. Such positive perceptions could, in turn, impact the overall classroom dynamic.

Our results raise a number of interesting points. First, the use of instructional rubrics does impact students' perceptions in several ways. In terms of overall course management and, in turn, student learning, rubrics can have a positive impact. A positive, open course

environment in which expectations are clear and shared up front with students can help in terms of increasing interaction in class and furthering student learning.

Prior research concludes and recommends that professors should think carefully about their performance expectations for students, and share such expectations *ex ante*. Professors are often very clear in their own head or thought processes about expectations, but then may not communicate those effectively to students. Rubrics provide a process tool to capture a professor's thinking in terms of expectations, and to more clearly share it with students. This is becoming more and more important as current assessment standards, such as those of AACSB, require that schools directly measure learning based on stated objectives, and rubrics provide a basis for such measurement. Further, as rubrics positively impact students' perceptions of the professor, this may be important in terms of student evaluation data for tenure and promotion processes.

One issue raised by our data is the use of rubrics across courses. Sixty-two percent of students in this study had received rubrics in other courses, yet this did not mean students were more likely to use the rubrics in this course. The use of rubrics varies by discipline, and by professor. Like any pedagogical tool, professors using rubrics should offer a general explanation of rubrics at the beginning of the course, along with explanation how rubrics will be used in the specific course. For example, in this introductory finance course we provided rubrics as a guide to students; subsequent research will explore student perceptions when the rubrics are used to provide detail in terms of grades.

CONCLUSIONS

Our study is an exploratory study, with a small sample size. However, as an exploratory study, our results show that students' perceptions related to rubrics are worthy of further study. Such research could explore the impact of different types of rubrics and the nature of their use. This study explores rubrics in one discipline, finance. As previously noted, subsequent research will compare students' perceptions of rubrics across business courses. We did not include private information in this study, for example, student grades or GPA. Future research could include data such as GPA or grades on individual assignments, and could also evaluate the level of learning on assignments such as the financial analysis paper.

As educators we share the common goals of improving our courses and increasing student learning. We explored the use of instructional rubrics to see how rubrics might impact students' perceptions of a course, its grading, and the professor. Based on prior research and our results, rubrics can provide a means of ongoing improvement in the course, and may be a way to better focus and deepen student learning.

ENDNOTES

1. We note that the average scores on a few questions are low – from 2.07 to 2.52 on a five-point scale. Subsequent research, not included in this paper, will explore differences across business courses, for example differences between Principles of Finance and Organizational Behavior. We feel the results can still be used in this exploratory study, as a less negative perception of some aspect of the course is important in terms of improving the course and student learning overall.
2. For instance, students were asked for their degree of agreement to the following three statements: (1) I feel the rubrics in this course helped me to understand the professor's expectations and grading criteria, (2) I frequently referred to the rubric for an assignment as I completed it, and (3) I checked my assignment to the rubric before I handed in my assignment. Since all three statements refer to the students' perceptions of the course, we sum together each student's responses to get one variable per student.

REFERENCES

- Allen, D., and K. Tanner, "Rubrics: Tools for Making learning Goals and Evaluation Criteria Explicit for Both Teachers and Learners," *Life Sciences Education*, Volume 5, Fall 2006, 197-203.
- Andrade, H., "Using Rubrics to Promote Thinking and Learning," *Educational Leadership*, Volume 57, Number 5, February 2000.
- Andrade, H., "Teaching with Rubrics," *College Teaching*, Volume 53, Number 1, Winter 2005, 27-30.
- Andrade, H, and B. Boulay, "Role of Rubric-Referenced Self-Assessment in Learning to Write," *The Journal of Educational Research*, Volume 97, Number 1, September 2003, 21-30.
- Arter, J. and J. McTighe, *Scoring Rubrics in the Classroom*, 2001. Thousand Oaks, CA: Corwin Press.
- Carrithers, D., T. Ling and J. Bean, "Messy Problems and Lay Audiences: Teaching Critical Thinking Within the Finance Curriculum," *Business Communications Quarterly*, Volume 71, Number 2, June 2008, 152-170.
- Decker, J. and M. Ebersole, "The Use of Scoring Rubrics in Management Accounting," *Academy of Educational Leadership Journal*, Volume 11, Number 2, 2007, 31-43.
- Dinur, A. and H. Sherman, "Incorporating Outcomes Assessment and Rubrics into Case Instruction," Institute of Behavioral and Applied Management, 2009, 291-311.
- Fink, L. D., *Creating Significant Learning Experiences: An Integrated Approach to Designing College Courses*, San Francisco, Jossey-Bass, 2003.

Hafner, J. and P. Hafner. "Quantitative Analysis of the Rubric as an Assessment Tool: An Empirical Study of Student Peer-Group Rating," *International Journal of Science Education*, Volume 25, Number 12, December 2003, 1509-1528.

Hegler, K., "Using General Education Assessment Rubrics to Document Basic Skills and Content Knowledge," unpublished working paper, January 26, 2003.

Mabry, L., "Writing to the Rubric," *Phi Delta Kappan*, Volume 80, May 1999, 673-679.

Mertler, C. A., "Designing Scoring Rubrics for Your Classroom," *Practical Assessment, Research & Evaluation*, Volume 7, Number 25, 2001.

Montgomery, K., "Authentic Tasks and Rubrics: Going Beyond Traditional Assessments in College Teaching," *College Teaching*, Volume 50, Number 1, 2002, 34-39.

Moskal, B., "Scoring Rubrics: What, When and How?" *Practical Assessment, Research & Evaluation*, Volume 7, Number 3, 2000.

Popham, W.J., "What's Wrong-and What's Right-with Rubrics," *Educational Leadership*, October 1997, 72-75.

Zikmund, W.G., *Business Research Methods*, 1997. New York: Dryden.

Table 1**Descriptive Statistics and Means****N=29 (includes two sections of course)**

Variable	Percentages	Mean	Mode
Gender	44% Male 51% Female (1 – No Response)		
Major	45% Business 55% Non-Business		
Graduating Class	24 of 29 – Sophomores & Juniors		
Self-Reported GPA		3.0 to 3.5	3.0 to 3.5
Perceived Course Attendance		4.1	4.0
The subsequent variables use a Likert Scale: 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, & 5=Strongly Agree			
Familiarity With Rubrics in Other Courses	62% of students had received rubrics in other courses	4.00	4.0
Average Use of Rubric		3.10	4.0
Professor Is Organized		2.79	4.0
Professor Clear About Expectations		2.07	1.0
Professor Provides Sufficient Feedback		2.72	3.0
Professor Is Concerned About Students		3.00	3.0
Rubric Ensures Grading Is Consistent		2.59	3.0
Rubric Ensures Grading Is Fair		2.86	4.0
Perception of Course: Intellectual Stimulation		2.52	3.0
Perception of Course: Harder Than Average Course		3.79	4.0

Table 2

Analysis of Use of Rubric by Student GPA, Gender, Major, and Student Familiarity with Rubric

	T-value Significance level in parens
Student GPA	-1.75 (.08)
Gender	-.750 (.45)
Major (Business or Non- business)	-1.82 (.07)
Student Familiarity with Rubrics	.384 (.69)

Table 3

Students Use of Rubrics Based on Course Management Software

(Data Coded As Follows: 0 = did not access rubric file; 1 = accessed day of assessment;
2 = accessed day before assessment, etc.)

Section1 - Business Majors Only; N = 17					
	Grand Average	Paper 1	Paper 2	Exam 1	Exam 2
Average	3.32	5.29	2.88	1.41	3.71
Median	2.75	3.00	3.00	0.00	3.00
STDEV	2.13	3.70	1.69	2.53	3.85
Longest	7.25	11.00	5.00	9.00	10.00
Shortest	0.50	2.00	0.00	0.00	0.00
N of 0	0	0	3	11	5

Section 2 - Non-Business Majors; N = 17					
	Grand Average	Paper 1	Paper 2	Exam 1	Exam 2
Average	5.21	4.53	12.12	1.59	2.59
Median	5.25	4.00	14.00	0.00	0.00
STDEV	3.81	2.76	10.11	2.62	4.91
Longest	11.50	10.00	26.00	9.00	13.00
Shortest	0.00	0.00	0.00	0.00	0.00
N of 0	1	2	2	10	12

Note: The number of students for Table 3 varies from Tables 1, 2, and 4 because all students are captured in the course management software, but some students were absent and were unable to respond to the survey. Also the Paper 2 score of 26 days for non-business majors is an anomalous outlier value due to a unique combination of weather cancelations, school holidays, and instructor decisions.

Table 4**Analysis of Student Use of Rubric and Perception of Professor, Grading, & Course**

		T-Value Significance level in parens
	Survey Variable	
Perception of Professor Variables	Professor is Organized	2.84 (.00)*
	Professor is Clear About Expectations	3.54 (.00)*
	Professor Provides Sufficient Feedback	2.12 (.03)*
	Professor Is Concerned About Students	2.78 (.01)*
Perception of Grading Variables	Rubrics Helped Ensure Consistency in Grading	2.18 (.03)*
	Perception that Grading Is Fair	2.48 (.01)*
Perception of Course Variables	Perception that Course Was Stimulating Intellectually	2.40 (.02)*
	Perception That Course Was Harder Than an Average Course	.741 (.46)

APPENDIX A

Exhibit 1: Financial Analysis Instructional Rubric

Financial Analysis Paper Instructional rubric					
Each FIN207 student is required to submit a report of 3-5 pages text plus exhibits <i>that critically analyzes a firm's financial condition</i> . The student may select any firm that interests them as long as its corporate name begins with the first letter of their last name. Students may not select a financial institution or a conglomerate firm.					
Task Dimension	Superior	Above Average	Average	Below Average	Unacceptable
Basic relevant knowledge of company	Student fully understands the nature of the firm's products, the technology of its doing business, and the competitive dynamics of its industry.	Student mostly understands the nature of the firm's products, the technology of its doing business, and the competitive dynamics of its industry	Student shows some understanding of the nature of the firm's products, the technology of its doing business, and the competitive dynamics of its industry, but omits some important factors.	Student shows little understanding of the nature of the firm's products, the technology of its doing business, and the competitive dynamics of its industry, and omits many important factors.	Student shows no understanding of the nature of the firm's products, the technology of doing business, and the competitive dynamics of its industry.
Selection of appropriate financial data	Student identifies a complete and truly compelling set of the firm's financial data.	Student identifies much and highly compelling set of the firm's financial data.	Student identifies some set of the firm's financial data, but omits some important data.	Student omits much important data.	Student identifies a very limited and uninformative set of the firm's financial data.

<p align="center">Necessary manipulation of data</p>	<p>Student calculates informative ratios where necessary, compares these to industry means to produce relevance, summarizes data in well-designed graphs, and integrates such information seamlessly into their report.</p>	<p>Student calculates many informative ratios, shows some relevance, summarizes data in graphs, and integrates such information into their report.</p>	<p>Student calculates basic ratios, attempts to show relevance, and summarizes data in graphs.</p>	<p>Student calculates some ratios, but shows little relevance, then summarizes data in graphs that need obvious improvement.</p>	<p>Student calculates few, if any informative ratios, shows no relevance, and does not summarize data in graphs.</p>
<p align="center">Evaluation and critical analysis</p>	<p>Student clearly communicates their findings and important critical insights into the firm's financial condition.</p>	<p>Student clearly communicates their findings but doesn't identify all important critical insights into the firm's financial condition.</p>	<p>Student has acceptable quantity of text, but tends to be too descriptive and insufficiently analytical.</p>	<p>Student rarely produces important critical insights into the firm's financial condition.</p>	<p>Student communicates their findings very poorly and shows no important critical insights into the firm's financial condition.</p>
<p align="center">Writing style/mechanics</p>	<p>The report is free of typos, misspelled words, and grammatical errors. The structure is logical with very effectively written first paragraph, body of report, and concluding paragraph.</p>	<p>The report is almost free of typos, misspelled words, and grammatical errors. The structure is logical with effectively written first paragraph, body of report, and concluding paragraph.</p>	<p>The report has some typos, misspelled words, and grammatical errors. The structure is logical with acceptably written, but improvable.</p>	<p>The report has noticeable numbers of typos, misspelled words, and grammatical errors. The logical structure is weak and writing needs substantial improvement.</p>	<p>The report contains many typos, misspelled words, and grammatical errors. The structure is not logical and without effectively written first paragraph, body of report, and concluding paragraph.</p>

Appendix A

Exhibit 2: Time Value of Money Hour Exam Instructional rubric

Financial Math Instructional Rubric					
FIN201/Fin207 students will take an hour exam that tests their knowledge of financial math, i.e. the time value of money, their understanding of the formulas and their ability to solve problems of simple compounding/discounting, ordinary annuity and annuity due operations, perpetuities, and other fundamental cash flow equations such as bond valuation and equity valuation.					
Task Dimension	Superior	Above Average	Average	Below Average	Unacceptable
Basic knowledge of financial math	Student always correctly identifies the relevant equation, identifies the input data, and successfully calculates the necessary output.	Student almost always correctly identifies the relevant equation, identifies the input data, and successfully calculates the necessary output.	Student sometimes correctly identifies the relevant equation, identifies the input data, and successfully calculates the necessary output.	Student seldom correctly identifies the relevant equation, identifies the input data, and successfully calculates the necessary output.	Student never correctly identifies the relevant equation, identifies the input data, and successfully calculates the necessary output.
Extended Knowledge of Formulas	Student shows extensive ability to manipulate the formulas and calculate second-order output such as minimum rates of return and necessary holding period intervals.	Student show significant ability to manipulate the formulas and calculate second-order output such as minimum rates of return and necessary holding period intervals.	Student shows some ability to manipulate the formulas and calculate second-order output such as minimum rates of return and necessary holding period intervals.	Student shows little ability to manipulate the formulas and calculate second-order output such as minimum rates of return and necessary holding period intervals.	Student shows no ability to manipulate the formulas and calculate second-order output such as minimum rates of return and necessary holding period intervals.

<p>Complex knowledge of formulas</p>	<p>Student always is able to use two formulas together to solve a complex financial problem such as bond valuation or retirement planning.</p>	<p>Student frequently is able to use two formulas together to solve a complex financial problem such as bond valuation or retirement planning.</p>	<p>Student sometimes is able to use two formulas together to solve a complex financial problem such as bond valuation or retirement planning.</p>	<p>Student seldom is able to use two formulas together to solve a complex financial problem such as bond valuation or retirement planning.</p>	<p>Student is unable to use two formulas together to solve a complex financial problem such as bond valuation or retirement planning.</p>
---	--	--	---	--	---