THE RELATIONSHIP BETWEEN SCORES ON A LANGUAGE DIAGNOSTIC TEST AND SUCCESS IN A BASIC COMMUNICATION COURSE IN A JUSTICE STUDIES DIPLOMA PROGRAM

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The Relationship Between Scores on a Language Diagnostic Test and Success in a Basic

Communication Course in a Justice Studies Diploma Program

by

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Abstract

Standardized tests are widely used to determine an individual's competency in a particular skill or in a particular area of study. These tests are generally used to measure a level of competence or understanding and to predict future success. Educational institutions rely on standardized tests for various purposes, including determining a student's enrolment eligibility in an institution, a program, or a course.

The Communications 1 course in the Centre for Justice Studies at Loyalist College in Belleville, Ontario, uses a language diagnostic test (LDT) to determine which students are eligible for exemptions from the course and to determine which students should be counselled to seek remedial support for spelling, punctuation, grammar, diction and usage, and sentence structure. The current study compared the results of the LDT with the results of final course grades to determine if the LDT had predictive ability. The current study followed and extended the findings of previous research that examined the extent to which standardized tests could predict students' final course grades in a basic business communications course.

The statistical analysis of the data in the current study found that a passing grade on the LDT does not guarantee that a student will pass the course, and a failing grade on the LDT does not guarantee that a student will fail the course. However, the analysis found that the higher the grade is on the LDT, the greater the chance is for a student to pass the course and that as the grade ranges increase on the LDT, the percentage of those who pass the course also increases.

Implications of this study are highlighted and encourage educational institutions and organizations that use standardized tests to determine a person's competency in a particular area to review the tests in order to ensure that the tests are in fact measuring what they are intended to measure and that all possible factors that could contribute to a person's decline, for example, in a course or on the job, be considered so that people, institutions, and organizations will be successful.

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Chapter 1.   Introduction

Loyalist College, located in Belleville, Ontario, is one of the province's 24 Colleges of Applied Arts and Technology, and enrolls approximately 3,000 full-time students (Loyalist College, n.d.). The college's Centre for Justice Studies provides two-year diplomas in the following five program areas: Community Justice Service Worker, Customs and Border Services, Investigation and Protection Services, Paralegal, and Police Foundations. These fields require employees to effectively communicate in writing; therefore, great emphasis is placed on communications courses in these programs. Students in each of the programs complete two introductory communications courses in the first two semesters and continue with program-specific communications courses in the third and fourth semesters.

Between 1985 and 1991 and from 1998 to present, multiple-choice Language Diagnostic Tests (LDT) have been completed by students in the Communications 1 course in the Centre for Justice Studies programs in order to determine the following: a) a student's competency level in English, b) whether a student should receive an exemption from the course, and c) whether a student needs remedial help. The tests cover five content areas: a) spelling, b) punctuation, c) grammar, d) diction and usage, and e) sentence structure. The LDTs that are currently in use were adopted from Humber College in Ontario in 1985 (personal communication, D. Lawrence, September 1, 2009). Since then, they have been modified by the Centre for Justice Studies at Loyalist College. The tests contain 50 questions with 10 questions per content area. Each section includes

progressively more challenging questions (see Appendix A for a copy of one of the diagnostic tests that is currently used).

The communications teachers generally operate under the assumption that the LDT is a reliable predictor of student success in Communications 1 because the content of the Communications 1 course, offered in the first semester, includes material covered by all five of the components of the diagnostic test. This may be a reasonable assumption, but given the significance of the importance of the communications skills required for those in the justice studies field, the reliability of the LDT to predict final course grades should be verified. If the test is a good predictor of student grades, it stands to reason that students who perform poorly on the LDT should be required to complete a remedial class before enrolling in the Communications 1 course. Also, this evidence would support the use of the LDT in determining appropriate candidates for course exemptions. If the test is a poor predictor of student grades, requiring students to complete a remedial class based on their LDT scores may not be justified by this assessment. Also, granting exemptions for the course based on students' LDT scores may not be justified by this assessment. Justification will depend on the degree of reliability the current study can determine the LDT to have.

1.1   *Adult Learning*

The LDT is a multiple-choice test that consists of 50 questions. It is a criterion-referenced evaluation that assesses the individual student's mastery of the content of the test (Cronton, n.d.). Considering that one purpose of this evaluation method is to determine a student's eligibility for an exemption from the Communications 1 course, the

LDT should be examined to determine if it is the best method to use when determining the student's knowledge of the content area in which he/she is being tested.

Weimer (2002) notes that measuring learning is a difficult process. If higher-order thinking is to be assessed, the task to create, develop, or find an instrument to measure learning becomes more challenging; however, students' ability to memorize or rote recall can be measured. The LDT is used to assess students' knowledge of certain topic areas and involves measuring lower-order thinking skills. Students' ability to complete the LDT requires them to have learned or memorized information or rules they may have experienced in the past, to comprehend the questions, and to apply the proper rules (Edwards & Briers, n.d.). Therefore, assessing the lower-order thinking skills that the LDT is intended to measure should be possible and can provide an accurate assessment of the students' knowledge of the content area.

On the other hand, considering that post-secondary institutions enroll mostly adults in the programs, completing the LDT and demonstrating a good understanding of the material may be difficult, or impossible, for many of the students. According to Merriam and Caffarella (1999), adults find speeded tasks to be difficult, and older adults are not able to quickly bring information to mind (p. 202). It was imperative, therefore, for the current study to determine whether or not the LDT measures what it is purported to measure. If it does not have predictive ability, then the test may create unnecessary frustration for the students, instead of providing a true indication of the students' knowledge of the content area.

1.2   Rationale

The purpose of the current study is to determine how well the LDT can predict final course grades in a basic communication course that is required for a Justice Studies diploma program. Richerson and Sutrick (1992) previously conducted a similar study to determine if a pretest could predict final course grades in a basic business communications course at Murray State University. In order to address the goal of the current study, this research will: a) attempt to reproduce results similar to those found in Richerson and Sutrick's study of the relationship between diagnostic pretest results and final course performance, b) investigate whether or not other significant relationships between the LDT and the final course grades exist, and c) examine if a minimum grade that a student must achieve on the diagnostic test in order to pass a communications course can be determined. The current study will extend the analysis by comparing the results of those students who received formal teaching of grammar (i.e., students whose grades are being used in the current study) to those of Richerson and Sutrick's participant group, who did not receive formal teaching of grammar. This comparison addresses a recommendation of Richerson and Sutrick.

Richerson and Sutrick (1992) determined that there was a positive correlation ($r =$ 0.34) between the pretest and the final course grades; however, the pretest was not an effective predictor of students' final course grades in a basic business communications course. The pretest correctly predicted final grades for 42.9% of the cases, but misclassified final grades for 57.1% of the cases. Therefore, they determined that the test was not able to accurately predict students' final grades.

Richerson and Sutrick (1992) concluded that the pretest was not a good predictor of final course grades because the linear correlation between the measures was too weak. However, a stronger correlation between the pretest scores and final course grades existed when the *grade ranges* were compared. Richerson and Sutrick's data indicated that a significant proportion of students who achieved a grade of B, C, or D on a pretest achieved that grade or higher in their course. The current study intends to reproduce these results. As well, it will expand on the significance of the correlation between the scores of those who achieved a B, C, or D on the LDT and the scores these students achieved in the course. The current study will also examine the LDT scores and the final course grades of those students who received formal teaching of grammar, so one could expect the relationship between the two grades to be at least as strong as that identified in the Richerson and Sutrick study. A significant number of students in the current study should achieve the grade they achieved on the LDT or a higher grade in the course.

Based on the findings of Richerson and Sutrick (1992), it is anticipated that the current study will find that a similar weak positive correlation between the LDT and final course grades exists, making the LDT a poor predictor of final course grades. However, a strong correlation should be found between the LDT and the final course grades when comparing the results of grade ranges, more specifically, the results for grades in the B, C, and D ranges. It is anticipated that students who achieve grades in these grade ranges on the LDT will achieve the same grades or higher in the course. Also, it is anticipated that the LDT will identify students who are likely to pass the Communications 1 course. The findings of the current study will either a) provide evidence that the diagnostic test is

an effective tool in measuring what it was purported to measure and thereby encourage its continued use, or, alternatively, b) provide evidence that the diagnostic test does not measure what it was purported to measure and therefore not recommend its use.

The results of the current study will provide useful information for the Centre for Justice Studies programs at Loyalist College, other post-secondary institutions offering similar programs that use comparable diagnostic tests, and educational institutions using standardized tests to determine the applicants who will be accepted and/or streamed into particular programs or courses. If the current study concludes that the LDT is a valid predictor of final course grades, the Centre for Justice Studies at Loyalist College would be justified to continue using the LDT to measure a student's competency level in English, to determine if a student should receive an exemption, and to determine if a student needs remedial help. The results would also support streaming students into different communications courses (e.g., a remedial course). If the current study concludes that there is a weak predictive ability between the LDT and the final course grades, educational institutions that rely on diagnostic tests and standardized tests for their predictive ability should be encouraged to review the test to determine if that method of testing accurately measures what it is intended to measure, if they have not already done so.

The results will also be useful for human resources departments and registrar offices in educational intuitions that rely on standardized tests for their predictive ability. Statistical information will be available for use by these departments and may facilitate a better understanding of the trends in student success and failure in the courses, like the

Communications 1 course in the Centre for Justice Studies programs at Loyalist College.
If the current study shows that there is a strong predictive ability in the test, the institution
would have evidence to support implementing a procedure of streaming students into an
appropriate remedial or upgrading course(s). Also, the institution may use the results of
the current study to support establishing more resources to better assist these students.
Streaming students into appropriate courses and offering support services to meet the
students' needs would likely increase retention for the institutions because the students
would likely be more successful in courses that are better suited to students' knowledge
and skill level and have support services available specifically for the students in the
remedial classes.

1.3   Ethical Considerations

The current study required approval from the Memorial University of
Newfoundland Interdisciplinary Committee on Ethics in Human Research (ICEHR) prior
to the researcher's gathering the required statistical data from the data holder—Loyalist
College. The researcher submitted a letter to the ICEHR that contained the required thesis
application form, a summary of the intended research, a statement to clarify any ethical
issues that apply to the current study, and copies of letters provided to, and an e-mail
from, Loyalist College. The ethical issues that needed to be addressed for the current
study were centred on the privacy and confidentiality of students whose grades were
being used for the current study. The researcher provided details of the method to be used
to ensure that students' anonymity and confidentiality would be ensured. The researcher
noted that students' data used would be aggregated with a non-traceable numeric and

alphabetic code and that the data would be kept in a locked cabinet until the data were used for analysis purposes solely and eventually destroyed. The researcher further noted that all levels of grades for each cohort would be grouped together, so individual student results would not be identifiable. The ICEHR granted approval to the researcher on October 4, 2010 (see appendix C for a copy of the letter).

The current study sought student academic data that were provided by Loyalist College. This data included the LDT scores and the final course grades of students who were enrolled in the Communications 1 course in the Centre for Justice Studies for the September 2005 (five cohorts), September 2007 (four cohorts), and January 2008 (two cohorts) semesters. To obtain the final grades, the researcher requested permission from the Loyalist College Registrar. This approval was granted, and the data were accessed on May 6, 2011. To obtain the LDT results, the researcher requested permission from the Loyalist College Human Services Advisor. This approval was also granted, and the data were accessed on May 6, 2011. Lastly, the researcher required approval from the Loyalist College Chair of the Research Ethics Committee for overall approval to continue with the current study using student data from Loyalist College. This approval was granted on November 3, 2011.

The current study also required a copy of one version of the LDT to be included in an appendix. In order for this property of Loyalist College to be included in this thesis, the researcher required permission from the Dean of the Schools of Business and Management Studies, Biosciences, and the Centre for Justice Studies. Permission to

reproduce the LDT was granted on October 13, 2011 (see appendix D for a copy of the e-mail from Dean Dan Holland).

1.4 *Research Questions*

The three research questions designed for the current study are as follows:

1. Can the Language Diagnostic Test predict the final course grades of students in the Communications 1 course in the Centre for Justice Studies?

2. Are the results of the current study consistent with those of Richerson and Sutrick (1992)?

3. Can the Language Diagnostic Test identify the minimum grade required for a student to pass the course?

1.5 *Definition of Key Terms*

Adult: "An adult in Canada is a person who has reached the age of majority. The age of majority in Canada is determined by each province and territory in Canada" (Munroe, 2012, para. 1).

Age of Majority in Ontario: "Every person attains the age of majority and ceases to be a minor on attaining the age of eighteen years" (E-Laws, 2006, para. 1).

Diagnostic Test: "A diagnostic test is a test that helps the teacher and learners identify problems that they have with the language" (British Council, n.d., para. 1).

Higher Order Thinking Skills: "Higher order thinking skills include critical, logical, reflective, metacognitive, and creative thinking" (King, Goodson, & Rohani, n.d., para. 1).

Lower Order Thinking Skills: Lower order thinking skills include "discriminations, simple application and analysis, and cognitive strategies and are linked to prior knowledge of subject matter content" (King et al., n.d., para. 1).

Passing Grade in the Centre for Justice Studies: A passing grade is 60% or higher.

Speeded Task: Speeded tasks are tasks that must be completed within a fixed amount of time.

Standardized Test: A standardized test "is a test that is administered and scored in a consistent, or 'standard', manner" and "are designed in such a way that the questions, conditions for administering, scoring procedures, and interpretations are consistent and are administered and scored in a predetermined, standard manner" (The Free Dictionary, 2012, para. 1).

The Current Study: The current study refers to The Relationship between Scores on a Language Diagnostic Test and Success in a Basic Communication Course in a Justice Studies Diploma Program study.

1.6   Summary

Loyalist College, one of Ontario's Colleges of Applied Arts and Technology, offers seven post-secondary programs of study (Loyalist College, n.d.), including Justice Studies. The Centre for Justice Studies provides two-year diplomas in the Community Justice Service Worker, Customs and Border Services, Investigation and Protection Services, Paralegal, and Police Foundations programs. Each of these programs requires students to complete the Communications 1 course in the first semester. An LDT is administered on the first day of the Communications 1 course to the students enrolled in

the course. The LDT determines a student's competency in English, determines if a student should receive an exemption from the course, and determines if a student needs remedial help.

The LDT is a criterion-referenced test that assesses lower-order thinking skills. This test may or may not be the most effective tool to use to assess students' knowledge of the content or competency to write well because mostly adults are enrolled in the program, and this speeded task may not provide an opportunity for the students to demonstrate their knowledge or competency. The question that arises is whether or not the LDT reliably measures what it is intended to measure: Does it have predictive ability?

Richerson and Sutrick (1992) conducted a study to determine if a pretest administered to students in a business communications course could predict final course grades in that course. The researchers concluded that there was a positive correlation, but the test was not an effective predictor of students' final course grades. The current study will review the Richerson and Sutrick study and will compare those results to the results of the current study. The current study will also review literature from organizations and educational institutions that use and rely on standardized tests. The current study will review literature that both confirms and refutes the predictability of standardized tests.

Chapter 2.   Literature Review

Standardized tests are widely used and relied upon across professions and educational institutions to determine the test taker's competency level in particular areas of study. The literature examined for the current study identified organizations that use standardized tests in their application processes. The organizations were selected from a number of occupational areas that align with programs offered through the Centre for Justice Studies at Loyalist College: Community Justice Service Worker, Customs and Border Services, Investigation and Protection Services, Paralegal, and Police Foundations. Considering that many employers in these areas use standardized tests to predict future performance of applicants, the assumption can be made that a standardized test in the Communications 1 course could also predict a student's future performance in the course.

The literature review also examined a variety of education providers that use standardized tests. Prospective and current students are often required to complete these tests in order for institutions to determine their suitability for particular courses or programs. The current study examined only justice occupations and educational institutions because they are directly related to the context of the education and careers of the population being studied. The current research study also examined existing research that confirmed that standardized tests have predictive ability and research that concluded that standardized tests did not have predictive ability. Lastly, the research also reviewed literature that explained the importance of communication skills, narrowing the topic to

communication skills directly related to the five program areas in the Centre for Justice Studies at Loyalist College.

2.1   *Justice-Related Employment and Standardized Tests*

Applicants seeking employment in many justice-related occupations are required to complete standardized tests or entrance exams in order to be hired or to move to the next stage in the hiring process. In the cases reviewed, all or part of the test contained a communications component.

Canadian jurisdictions require every person seeking training required to become a police officer to successfully complete several tests that are included in the hiring process, including a writing test and a reading comprehension test (Canada FAQ, n.d.). To become a police constable in Ontario, applicants are required to proceed through a selection process, which involves a stage that requires the applicant to complete a communications test. Municipal Police Services and the Ontario Provincial Police (OPP) administer the processes for their own respective organizations (Ontario Association of Chiefs of Police, [OACP], n.d.). The OPP requires that applicants complete a pre-interview assessment, which includes the Written Communication Test (WCT) (OPP, n.d.). All municipal police services in Ontario require applicants to complete the WCT. For example, the Toronto Police Service requires its applicants to complete a 10-stage selection process. This process begins with three tests, one of which is the WCT. (Toronto Police Service, 2010). At the national level, the Royal Canadian Mounted Police (RCMP) uses the RCMP Police Aptitude Test (RPAT) as one component of the application process for determining applicants' suitability for employment as RCMP

officers (Royal Canadian Mounted Police 2010a). This test measures several essential skills of a police officer, including composition (i.e., spelling, grammar, and vocabulary) and comprehension (RCMP, 2010b).

Other justice agencies outside policing services also require similar assessments. For example, the Correctional Services of Canada allows its applicants to continue to its training program after the applicants have successfully completed and passed the screening process (Correctional Service Canada, [CSC-SCC], 2011). One of the areas tested in the screening process is the applicant's written communications ability (CSC-SCC, 2009). The Canada Border Services Agency also uses a standardized test—the Border Services Officer Test—to assess applicants for positions within the Agency. Applicants must successfully complete this test to be selected for any position (Canada Border Services Agency, [CBSA-ASFC], 2011). The agency's multiple choice test consists of 15 subtests, one of which assesses an applicant's knowledge of grammar (CBSA-ASFC, 2006). Security guards in most Canadian provinces are similarly required to successfully complete standardized multiple-choice tests to obtain a security guard license or to maintain an existing license. These tests evaluate an individual's knowledge and his or her suitability for a career in providing security services (Robertson, 2010). It is also the case that every American Bar Association-approved law school and most Canadian law schools require applicants to successfully complete the Law School Admission Test (LSAT) to be admitted to a program in law. The standardized LSAT is designed to measure acquired reading and verbal reasoning skills of all law school applicants (Law School Admission Council, [LSAT], 2010).

The entrance exams and the recruitment processes for all of the above-mentioned justice fields can be so overwhelming and challenging that some applicants may not advance because they are ill-prepared for the screening process. Because the challenge is so great, testing services like Test Ready Inc. and other test preparation services provide professional training courses to help applicants prepare for the testing process (Bedwell, 2011).

Clearly, the use of standardized tests in the field of justice is the accepted norm, and these tests are heavily utilized to screen applicants for, among other things, their communications skills. However, these tests are not limited to this employment sector, nor are they limited to testing a person's communications skills. The literature examined in the current study found that educational institutions, including elementary, secondary, and post-secondary, also rely on standardized tests, but the skill(s) being assessed depended on the institution.

2.2 *Educational Institutions and Standardized Tests*

Educational institutions at all levels use standardized tests for at least one of the following reasons: a) to determine eligibility of the students for admission into the institutions, programs, and/or courses b) to stream students into appropriate courses and programs, c) to determine exemptions, and d) to assess the quality or effectiveness of a course, program, or school. There is a wide variety of such tests in use across education systems.

The Scholastic Aptitude Test (SAT) is used as an admission test for universities and colleges in the United States of America to determine an applicant's competency

level in reading, writing, and mathematics (College Board, 2010). There are many other examples of such assessments that are in use. Some of these tests are tailored for use by individual educational organizations and institutions. For example, the Illinois Mathematics and Science Academy (IMSA) uses the SAT I as part of its screening criteria to assess the students who enroll in its residential high school program (Illinois Mathematics and Science Academy, 2001). The University of South Florida administers an English diagnostic test as part of its admission process for the Mass Communications program (University of South Florida, 2010). Murray State University (1992) requires that its undergraduate business degree students complete a Diagnostic Writing Skills Test pretest to identify punctuation and grammar usage problems in order to direct students to receive remedial help (Science Daily, 2007). The University of North Texas relies on SAT results when determining a freshman's eligibility to enroll in the school (University of North Texas, 2006). The same university requires its students to complete a Grammar, Spelling, and Punctuation (GSP) test if the students plan to minor in news in the Department of Journalism (University of North Texas, 2012).).

In Ontario, the Education Quality and Accountability Office (EQAO) assesses achievement of Ontario elementary and secondary school students by having the schools administer standardized testing for students in grades 3, 6, and 9 to evaluate students' reading, writing and math abilities. The results are used to determine the education system's effectiveness and to assist in developing school improvement plans (Desbiers, 2012; Education Quality and Accountability Office, 2012; The Elementary Teachers' Federation of Ontario, 2011).

Canadian colleges and universities also use standardized tests as part of their application process to stream students into the proper courses and programs. For example, Concordia University in Montreal administers a 45-minute placement test to applicants for several of its English composition courses. The test requires the applicant to write an essay, responding to a short reading. The results are used to determine which English composition course is best suited to the applicant's writing needs (Concordia University, 2012). The Mathematics Department at the University of Calgary requires that students in programs requiring one or more math courses complete a mathematics diagnostic test to determine possible exemptions from the university's mathematics courses (University of Calgary, 2011). Many Atlantic Canadian universities require applicants to complete a placement test before commencement of courses that require a degree of proficiency in calculus. The results on the test may be used to determine whether or not the applicant must complete a remedial course before a student can enroll in a calculus course. At some universities, the applicant may be advised to take a remedial course or be permitted to enroll into a less-aggressive course that takes two semesters to complete instead of one (Department of Mathematics and Computing Science, Saint Mary's University, n.d.).

Colleges in Ontario also use standardized tests for the same reasons. Seneca College requires all students enrolled in certificate, diploma, or degree programs to be tested for their English and mathematics skills. The results of the Skills Assessment are used to determine academic placement. Once the testing is completed, the student will be notified of the subjects they will be enrolled in, their skill level in English and

mathematics, and of the student support services that are available to them in particular

subject areas (Seneca College, n.d.a, n.d.b). Humber College may have students complete

a placement test to determine the communications and math courses that are best suited to

the student's needs. Depending on the results, the college may require the student to

complete supplemental courses while enrolled in a particular program (Humber College

n.d.). George Brown College assesses most of its new students for their proficiency in

English and mathematics. All applicants who are mature students, who apply to over-

subscribed programs, which determine acceptance by admission test results, and/or who

are required to provide proof of language proficiency are required to complete the

admission test. The results are used to determine the first-semester English and/or

mathematics course in which the student will be enrolled (George Brown College, n.d.).

Fleming College tests communications skills for most of its students, and some students

at the college are required to complete communications, mathematics, and computers

tests. The testing is used to assist the college in determining the appropriate support the

students will need to succeed during their first semester (Fleming College, 2012).

Fisher and Hoth (2010) recognized that it is critical for Ontario's public colleges

to identify those students who are at risk of not being successful in the programs in which

they are enrolled because of their language deficits. They reported that 62% of the

colleges reported having a formal language skills assessment for programs, but the

assessments varied by method and instruments used, across, and sometimes within,

colleges. Fisher and Hoth recommended that a consistent approach be taken to identify

and to assist those students whose language deficiency may result in their lack of success in their programs (HEQCO, n.d.).

The Ontario colleges are not the only educational institutions that rely on standardized tests. Standardized tests are prevalent and relied upon at all levels of the education continuum and across disciplinary areas. Considering that standardized tests hold such an important role in determining an individual's future educational or career path, determining whether or not the tests reliably predict what they are intended to predict is of paramount importance.

2.3   *Standardized Tests: Are They Valid and Reliable?*

The widespread use of standardized tests provides a good indication of the reliance that is placed on these tests and the extent to which they are used to determine an applicant's suitability for particular occupations, post-secondary education programs, or individual courses. Bordie (1972) noted that the validity of the placement tests and diagnostic devices that school programs relied upon considerably was often open to question. He noted that the extent of their usefulness and their ability to identify linguistically different groups was questionable. He pointed out that "stress, intonation, and pitch along with all associated para-language gestures were more indicative of language ability than…syntax, vocabulary, grammar, and so on" (para. 4). Bordie stated that one should not simply question whether a test measures well what it is intended to measure, rather the question should be whether the test is measuring the right thing. Despite cautionary remarks like Bordie's, 40 years later, standardized assessments continue to be widely used in educational institutions and across a variety of professions.

Given the number of these types of tests and their widely accepted use, it is appropriate to question whether or not standardized tests are always reliable in predicting a person's competency in a particular area. A review of the literature indicated no definitive agreement on the use of these test instruments. There were strong opinions on both sides of the argument, some against the use of standardized testing and some in favour.

Kohn (2000) vehemently disagreed with the use of standardized testing that has had a prominent role in education. He criticized such tests for not being objective even though the testing may have appeared to be scientific. He noted that people create the tests, people decide the questions that will be on the tests, and people mark the tests; therefore, there is room for bias. Also, he noted that the grades received by the students who write the tests may not be reflective of the students' actual ability. For example, some students may have text anxiety or may not take the test seriously. Kohn suggested that the tests do not effectively predict future academic performance and that the tests do not provide a good indication of thinking or aptitude. He further noted that multiple-choice exams do not allow students to generate a response; they simply must choose one answer from a variety of options without being able to expand on their answer. Kohn noted that when educators focus on the number of errors found in a piece of composition, the "process of thinking has been severely compromised" (p. 23).

In a similar manner, the National Centre for Fair and Open Testing (2007) stated that "the SAT I has little value in predicting future college performance" (para. 1). Bridgeman, Burton, and Pollack (2008) found that the high school grade point average was a slightly better predictor of cumulative college grades than was the standardized

Scholastic Aptitude Test (SAT.) The same researchers also found that university English grades were the second most difficult to predict. Eventual grades in education courses were the most difficult to predict using SAT scores.

Researchers in the Illinois Mathematics and Science Academy (lMSA) Research and Evaluation Office stated that the SAT I score was a useful predictor of grades, but it was minimally useful as a predictor of graduation from IMSA. The researchers also noted that analyses were limited to students accepted at Illinois Mathematics and Science Academy, so the SAT I did not show a predictive value of screening by all students, only those who were accepted. Therefore, excluding the scores of the students who were not accepted reduced the potential magnitude of the relationships found. The success rates were limited to only those who were accepted. It was recommended that testing for the predictive value should be done by admitting students from a full range of scores and tracking the success of all students (lMSA, 2001).

Korbin, Patterson, Shaw, Mattern, and Barbuti. (2008) studied the predictive validity of the SAT, with the additional writing section, in reviewing the first-year college grade point average of students from 110 four-year colleges and universities across the United States in the fall 2006. Their considerably large sample consisted of 151, 316 students. The researchers found that of the critical reading section (SAT-CR), the mathematics section (SAT-M), and the added writing section (SAT-W), the SAT-W section was the most highly predictive section. The researchers also concluded that the best predictors of first-year grade point average are the high school grade point average (HSGPA) and overall SAT scores ($r = .46$).

Wood and others (1990) collected data from 7,635 freshmen students at a mid-western state university, examining the possible relationship between Form E (Vocabulary and Comprehension subtests) of the Nelson-Denny Reading Test (NDRT-E) and other indicators of academic success, including high school grade point average (HGPA) and college grade point average (CGPA), high school rank, American College Testing Program Scores (ACT), and SAT scores. The sample included data collected during a preregistration period from students enrolled in the spring semester of 1989. The NDRT-E tests were administered to guide students into the most appropriate college classes. The researchers attempted to determine if the NDRT-E could predict success of college students, so results found on the NDRT-E were correlated with college course grades. Also, the researchers attempted to determine the degree to which the CGPA could be predicted from HGPA, NDRT scores, and ACT scores. The researchers found that the NDRT-E correlated positively with CGPA, with HGPA, with the ACT scores, and with SAT Verbal scores, but the researchers concluded that neither the vocabulary sub-scores nor the comprehension tests sub-scores on the NDRT-E provided much diagnostic value. The researchers also concluded that HGPA was the best single predictor of CGPA ($r = .537$) and that the NDRT-E did not add any predictive validity to systems that use HGPAs and either ACT or SAT scores.

To adhere to California matriculation regulations, which required community colleges to demonstrate that standardized placement tests were valid predictors of future course success, College of the Canyons conducted predictive validity studies for seven placement tests. The College Board Assessment and Placement Services (APS) for

Community College Writing Test was one of the placement tests examined. This objective-format writing test consisted of 40 questions and was used to predict student success in basic skills and college-level English courses. The researchers concluded that the APS Writing Test did not prove to have predictive validity for one of the four English courses. The researchers point out that their sample size was too small to draw any conclusions about validity for the remaining three courses. The researchers recommended further research to be conducted to qualify the APS test as a valid predictor of future course success and as a tool for directing students to the appropriate English classes (College of the Canyons, 1993).

Venezky (1992), while studying the validity of placement testing of the Adult Basic Education (ABE) program administered by the U.S. Department of Education, Labor, and Health and Human Services, concluded that such testing is not reliable for determining the class in which a student should be enrolled. Venezky observed that because many adult learners in the study were entering literacy programs for the first time, they had poor test-taking skills, so their results tended to be lower than they would have been if the test had been given after several weeks of instruction.

Turner (1993) conducted a study at North Shore Community College (NSCC) to determine if a test score on a General Educational Development (GED) Writing Skills Test could predict a passing grade in the College Level Examination Program (CLEP). Of the 73 who passed the GED Writing Test, 30 passed the CLEP. A correlation analysis showed that a valid predictability between the two tests did not exist. Turner concluded that the GED scores could not reliably predict those who would or would not pass the

CLEP exam. Therefore, the GED scores should not be used to determine who should or should not be permitted to write the CLEP test or enroll in college classes.

Smittle (1995) noted that many colleges were using mandatory assessment and placement tests to help identify students who were at risk of failing. Because a gap between high school exit standards and college entrance requirements exists, the predictive ability of the high school grade point (HGPA) average was subject to question. Smittle examined the results from the Computerized Placement Test (CPT), high school GPA, high school rank, senior year absences, race, and gender. The researcher found that high school GPA had the strongest relationship with college GPA ($r = .52$). However, the researcher also noted that academic and nonacademic variables should be considered when attempting to predict future success of a student.

In contrast to those noted above, other studies have concluded that there is predictive validity in the use of standardized tests. For example, Hoffman and Ziegler (1978) studied whether or not a standardized language test could be used to predict which college students should be recommended to complete remedial work. The students submitted a writing sample and completed the California Language Test (CLT), which includes subtests that measure punctuation, capitalization, and word usage. The researchers concluded that the results warrant the use of the CLT as a preliminary screening device.

Bissell and Collins (2001) studied factors that could be early predictors of students' ability in introductory journalism writing courses from one university in the Southwest and one university in the Midwest of the United States. The researchers had

students complete a questionnaire about students' self-efficacy, high school journalism experience, college newspaper writing experience, previous exposure to a newspaper, and high school and college grade point averages. Then the students were given a 20-question grammar pretest and a writing assignment. The results on the questionnaire and the pretests were compared to determine the factors that led to student success in the semester. The researchers not only concluded that there was a relationship between college GPA and success on the grammar and writing test and the success in the semester, but they also noted that attitudes and experience contributed to a student's success.

Adebayo (1993) conducted a study to determine how accurately student academic success may be predicted from selected student characteristics of adult learners enrolled in a first-year social work program and from the test score results from the Nelson-Denny Reading Test (NDRT). The 60 students were in their first year of a two-year social work diploma program at the Alberta Vocational College. Adebayo found that the vocabulary score on the NDRT was a significant predictor of academic achievement and that age, gender, number of years since attending school, and other variables did not predict success of social work students.

In order to examine the predictive validity of placement tests and course grades and retention in English and mathematics, Armstrong (2000) assessed data from 3,935 students enrolled in one of three levels of English and 3, 719 students enrolled in three levels of mathematics courses. The researcher considered dispositional factors in the study including "cognitive, behavioural, and affective traits, such as self-efficacy, past

experiences, or performance in school, involvement in school activities, high school GPA, high school preparation, and perceived importance of attending school" (p. 685). Armstrong found that the correlation between placement test scores and course grades was too low to offer predictive ability (below r = 0.35). However, he found that dispositional variables had the stronger predictive ability and subsequently recommended that students not be placed on a single measure, such as a placement test, and that dispositional data be collected when attempting to determine future performance.

Mattern and Packman (2009) observed that a disconnect existed between educational requirements of secondary institutions and those of postsecondary institutions. Because of this disconnect, many institutions were administering placement tests for incoming students, and many students required remediation. To determine the true validity of the placement tests, in particular ACCUPLACER—a College Board's computer-adaptive placement system used to assess students' knowledge and skills in a variety of subject areas—the researchers examined 47 ACCUPLACER validity studies conducted between 2001 and 2006. The researchers found that there was a moderate relationship between test scores when success was defined by the student obtaining a C or higher (r = .34) in the course and when success was defined by the students obtaining a B or higher (r = .42) in the course.

2.4 *Language Diagnostic Tests*

In general, the literature reviewed for the purposes of the current study supports the claim that not all standardized tests reliably measured what they were purported to measure and not all provided the intended or expected results. Considering that there was

no definitive conclusion about the reliability of diagnostic tests, it was necessary for this researcher to review studies involving language diagnostic tests and their predictive ability in communications courses.

Olson and Martin (1981) noted that community college educators supported entry-level assessment of their students but questioned what the assessment needed to contain and what information the assessment should provide in order to successfully guide their students into appropriate programs and courses. The researchers also noted that a formula for assessing probable success of writing skills of entering community college students did not exist and that each institution was required to determine its own procedure. The researchers explained an entry-level writing skills assessment and procedure that was used at one community college. The assessment used contained a writing sample; an objective test, composed of 40-multiple-choice questions regarding items such as grammar and sentence structure; and a self-assessment. The researchers concluded that the results for the three tests varied considerably and that the objective test was the best predictor of English proficiency for English credit enrollees.

Annable (n.d.) evaluated a grammar and vocabulary multiple-choice subtest that was used to evaluate grammar, vocabulary, listening, reading, writing, and speaking abilities of second-year Hungarian university students. The researcher attempted to comment on the validity of the test as a reliable predictor of these students, training to be English teachers, to have sufficient language competence to progress to the third year of studies and to be successful in the teaching practice. Annable concluded that the test was valid in its ability to predict whether the students who pass the test also succeed in their

studies. However, the test did not predict with reliability a relationship between the test

scores and the success in the teaching practice. The researcher noted that the test may not

be a valid method of measuring what it was intended to measure. If the only goal of the

test were to predict students' success in the course, the test may be considered valid.

However, if a second goal of the test were to predict who would be successful in the

teaching profession, then the test would not be valid. The issue noted is the intent or

purpose of the test not being properly identified.

In an attempt to determine if standardized tests are reliable in predicting a

person's competency in a particular area, Richerson and Sutrick (1992) studied the

relationship between scores on a diagnostic writing skills test and students' final course

grades in a basic business communications course. They examined the pretest's

effectiveness as a counseling tool and its usefulness in directing students to continue in

the course, to complete remedial work, or to work on problem areas. The Diagnostic

Writing Skills Test used by Richerson and Sutrick consisted of blocks of questions

covering four content areas: a) nonsensical constructions, fragments, fused sentences, and

comma splices; b) subject-verb agreement, pronoun-antecedent agreement, dangling and

misplaced modifiers, and parallelism; c) tenses of regular verbs, tenses of irregular verbs,

case, point of view (e.g., shifts in tense, person, number), pronoun reference, and adverb-

adjective confusion; and d) period, comma, semi-colon, apostrophe (e.g., contractions

and possessives), quotation marks, question marks, exclamation marks, colon,

parentheses, brackets and dash, capitals, italics and underlining, spelling, hyphenation,

and abbreviations. Students were given the results of the pretest, but they did not receive any formal grammar teaching in the course.

After Richerson and Sutrick (1992) cross tabulated students' pretest scores and final grades, they found that there was a positive correlation between the two sets of scores. However, the Pearson correlation was 0.34, which the researchers determined was too low to indicate predictive ability. They concluded that students who did not do well in the pretest should have been encouraged to seek help in problem areas but should not have been encouraged to drop the class or be told that they would not perform well in the course. Richerson and Sutrick recommended that further research should be completed to test the relationship between pretest scores and final performance scores with students who received formal grammar teaching.

A secondary purpose of Richerson and Sutrick's (1992) study was to confirm the findings of Lally's (1980) study from the University of Utah. Richerson and Sutrick (1992) determined that the data and results were comparable between the two studies; however, the conclusions made by the researchers in each case differ. Lally (1980) had conducted a similar study to determine if a pretest could be helpful in predicting which students a) would fail a business communications course; b) could probably pass if they desired, meaning students who would struggle with the material but could pass if they put forth effort; and c) would easily succeed, meaning those who would succeed with little effort.

After comparing students' pretest scores with their final grades using frequency distribution, Lally (1980) found that a pretest could reasonably predict student success.

Lally concluded that an objective pretest could predict student achievement in a high percentage of cases. However, the researcher also noted that the test was not useful in predicting which students should complete remedial work before completing the business communications course. She found that the pretest was useful for the following: a) indicate probability of success or failure; b) forewarn students that they will struggle in the course; c) motivate students; and d) insist students with inadequate skills attend a writing skills lab, work independently, or obtain a tutor while completing the business communications course.

Richerson and Sutrick (1992) and Lally (1980) reached different conclusions regarding a pretest's ability to predict final course grades in a business communications course. Richerson and Sutrick (1992) concluded that a diagnostic grammar pretest could not reliably predict final course grades, and Lally (1980) concluded that an objective pretest that evaluates basic skills could predict student achievement in a high percentage of cases. The current study will also compare students' results on the LDT to the results of the students' final course grades in a Communications 1 course in the Centre for Justice Studies at Loyalist College in order to determine if the LDT used has predictive value on course grades.

2.5   *The Importance of Communications Skills*

The Conference Board of Canada[1] stated that the ability to communicate is one of the three academic skills "which provide the basic foundation to get, keep and progress on a job and to achieve the best results" (The Canadian Alliance of Life Skills Coaches

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[1] The Conference Board of Canada is an independent, non-profit research organization (Conference Board, 2012).

and Associates, [CALSCA], n.d., para. 1). Tesch (1979) noted that many educators and business people would agree that grammar and usage are valuable tools that students should master. He also stated "that grammar, punctuation, and spelling are essential skills that form the foundation for effective written communication" (p. 53). Employers are looking for people who can communicate effectively by listening, comprehending, and writing in the language in which business is being conducted (CALSCA, n.d.). According to Crompton (1996), "36 percent of Canadian Workers have marginal literacy skills" (para. 4). Therefore, improving the abilities of workers with limited literacy skills is essential. Crompton suggested that although this will be a huge challenge for employers, it is necessary so that economic growth and productivity do not suffer.

Increasingly, post-secondary educational institutions are being held accountable by government agencies for the program curriculum they design. This includes, in particular, any communications curriculum students may be required to complete. In Ontario, the Ministry of Training, Colleges and Universities requires that all graduates with any Ontario college credentials be able to reliably demonstrate the six categories of the Conference Board of Canada's Essential Employability Skills, one of which is Communication. Graduates must be able to "communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience" and " respond to written, spoken, or visual messages in a manner that ensures effective communication" (Ontario Ministry of Training, Colleges and Universities, 2009, Learning Outcomes Section, para. 1).

Consequently, the programs in the Centre for Justice Studies at Loyalist College must ensure that they meet the requirements set by the government so that graduates have the ability to communicate with an appropriate level of proficiency (as outlined by the Essential Employability Skills). This reflects the essential need for people employed in justice-related occupations to communicate effectively and accurately. For example, the professional responsibilities of workers in the justice field often include completing official legal documents. Taking into account the critical role that communications plays in the justice field, the required communications courses must provide the students with the means to understand the material that will enable them to write well.

2.6 Summary

A review of the literature for the current study confirmed that organizations across professions and educational institutions use and rely on standardized tests to determine a person's competency level in particular areas of study and to predict that person's future success in that field of employment or in a particular course or program. The literature examined identified organizations that use standardized tests in the application process. The organizations were from each of the program areas in the Centre for Justice Studies at Loyalist College: Community Justice Service Worker, Customs and Border Services, Investigation and Protection Services, Paralegal, and Police Foundations. The literature provided evidence that applicants seeking employment in many justice-related occupations are required to complete standardized tests or entrance exams in order to be hired or to move to the next stage in the hiring process. The literature also provided evidence that each of the organizations examined have a communications component in

the standardized tests. The literature review also examined a variety of educational facilities that use standardized tests. Prospective and current students are often required to complete these tests in order for institutions to determine the students' suitability for particular courses or programs. The current study examined only the two above-mentioned fields because they are directly related to the context of the education and careers of the population being studied. The current study also examined existing research that provided evidence that supported the view that standardized tests have predictive ability and research that concluded that standardized tests do not have predictive ability. The literature provided evidence to support the view that the debate is ongoing. Lastly, the current study reviewed literature that explained the importance of communication skills, narrowing the topic to communication skills directly related to the five program areas in the Centre for Justice Studies at Loyalist College. The literature supports the importance placed on a person's having strong communications skills and the importance of educational facilities' providing education to enhance and improve those skills in their students.

     The literature review provided sufficient evidence for this researcher to conclude that further research must be conducted to study the validity of standardized test scores in predicting success in a particular area of study. Therefore, this researcher investigated predictive validity of a language diagnostic test that is used in the Communications 1 course in the Centre for Justice Studies at Loyalist College.

Chapter 3.   Methodology

The sample for the current study consisted of 272 students who were enrolled in the Justice Studies Communications 1 course at Loyalist College between 2005 and 2008. The course was offered in the first semester of year one in one of the following two-year programs: Community Justice Service Worker, Customs and Border Services, Investigation and Protection Services, Paralegal, and Police Foundations. The sample included students who were enrolled in this course in one of the following semesters: September 2005 (five cohorts), September 2007 (four cohorts), and January 2008 (two cohorts). The sample also included students who had graduated from high school or had high school equivalent credentials. Several different instructors taught the courses, but the same evaluations were used for each section in each cohort. Also, the instructors met frequently throughout the semesters to ensure consistency of their instruction and the evaluation among the cohorts.

The LDT results used for analysis in this study were provided by Loyalist College's Human Services Advisor, and final course grades were provided by Loyalist College's Registrar. Both sets of data were provided on Microsoft Excel spreadsheets. The student identifiers—names and student numbers—were not included; rather a non-traceable numeric and alphabetic code was included. The data were combined into one spreadsheet and included the student numeric and alphabetic code, the LDT results, and the final course grades.

The current study, like that of the Richerson and Sutrick (1992) study, compared the results of a multiple-choice language diagnostic test and students' final course grades.

The presentation of data includes a cross tabulation between the Language Diagnostic Test (LDT) scores and the final course grades along with a box plot of the cross tabulation data. These graphic illustrations helped in determining if any correlation existed between the LDT results and the final course grades.

The current study also quantified the extent of the relationship between the two scores by calculating Pearson's product-moment coefficient and by performing a regression analysis. Pearson's correlation coefficient (r) was be used to determine the degree to which there was, or was not, a linear relationship between the LDT results and the final course grades. For example, if a student achieves a B on the LDT, he/she should achieve a B in the course.

A regression analysis was used to determine if there was, or was not, any predictive value for the LDT results. Specifically, the regression analysis was used to develop an equation to predict a student's final course grade from that student's score on the LDT. The predicted final course grade for students was compared to actual final course grades to verify the predictive value of the LDT. This analysis also facilitated a comparison between the results of the students' grades from the current study and the results of the pretest scores and final course grades found in the Richerson and Sutrick (1992) study.

In addition to examining the data for a linear correlation between the LDT results and the final course grades, comparisons of each LDT grade range with final course grade outcomes was conducted to determine if any other trends existed in the data. For example, the data were examined to determine if higher LDT scores resulted in a higher

probability of passing the course, if lower LDT scores resulted in a lower probability of passing the course, and if LDT scores could predict the minimum grade a student could achieve in the course.

All statistical calculations were performed in Microsoft Excel 2007™ using Excel's statistical functions (including the CORREL function) and the regression tool from Excel's Data Analysis Package™. Charts were constructed using Microsoft Excel 2007™ charting tools.

Anonymity and confidentiality of the students was ensured by aggregating the data with a non-traceable numeric and alphabetic code to represent individual students. Also, the data are being stored in a locked cabinet and will be destroyed five years after the thesis has been completed. At that time, all data will be destroyed. In order to obtain and use the students' results on the diagnostic tests and in the Communications 1 course, permission from Loyalist College's Office of the Registrar and Human Resources department was sought through application letters written by the researcher. Approval from the data holder was provided to the researcher.

The current study followed Richerson and Sutrick's (1992) fixed grading scale. The only difference was the letter grades associated with each numeric grade range (see Table 3.1). To facilitate comparisons between the current study and that of Richerson and Sutrick, reporting of letter grades was based on the letter grades used by Richerson and Sutrick. Because both studies used equivalent grading scales and consider 59% and lower to be a failing grade, any statistical analysis between these two studies was comparable.

All students who wrote the diagnostic test were told that the diagnostic test results would not be calculated into their final course grade. They were informed that the purpose of the test was to determine a) their competency level in English, b) the areas of English in which they needed extra help, and c) a student's possible exemption from the Communications 1 course. If a student achieved 90% on the LDT, he/she would have been offered an exemption in the course.

Table 3.1

Numeric Grade to Letter Grade Conversion

Grade Range	Richerson and Sutrick	Centre for Justice Studies
90 – 100	A	A+
80 – 89	B	A
70 – 79	C	B
60 – 69	D	C
0 – 59	E	F

The students wrote the diagnostic test in their first Communications 1 class of the semester. They were allowed 60 minutes to complete the LDT, which consisted of 50 multiple-choice questions. The students were allowed no aids, such as reference books or dictionaries. They were not permitted to speak to each other, and the teachers were not permitted to provide assistance regarding questions about the content of LDT. The students were given their results within two weeks of writing the test. This gave them the opportunity to identify the areas where they needed extra help; however, they were not required to seek extra help in these areas.

The test results for those who scored 0 for their final grade in the course was not factored into the statistical analysis for the current study because the students who attained this grade did not submit any course work to be evaluated. Therefore, there were no means of assessing their knowledge and skill of the course material to assign a final course grade. Including their results would potentially skew the results and jeopardize the integrity of the study. Also, the current study did not include final course grades of those students who did not write the LDT at the beginning of the semester. Scheduling limitations did not allow students who were unable to write the LDT on the day it was administered to write it on a later date. Because the purpose of the current study was to assess the hypothesis that scores on a diagnostic test can predict final course grades, final grades for students who did not write the LDT could not be factored in to the statistical analysis.

3.1   Summary

The current study examined LDT scores and final course grades of 272 students who were enrolled in the Communications 1 course in semester 1 in the Centre for Justice Studies at Loyalist College. The sample consisted of 11 cohorts from three semesters: five from September 2005, four from September 2007, and two from January 2008. Each cohort was given the LDT in the first class of the semester and given the same evaluations throughout semester, and the teachers met frequently throughout the semesters to ensure consistency of instruction and evaluation among the cohorts.

The results of the LDT were compared with the results of final course grades to determine if the LDT had predictive ability. Final course grades of 0 and final course

grades of students who did not write the LDT were not factored in the statistical analysis so that the results would not be skewed and thus would not jeopardize the integrity of the study. The Pearson's product-moment coefficient was used to determine the degree of the linear relationship, and a regression analysis was used to determine the predictive value of the LDT results. Also, the data were examined for any other possible trends such as higher LDT resulting in higher course grades. These results were compared to those in the Richerson and Sutrick (1992) study, which compared pretest results to final course grades in a basic business communications course.

Chapter 4.   Results

This study examined the predictive ability of the Language Diagnostic Test (LDT) used in a Communications 1 course in the Justice Studies program at Loyalist College. The sample included LDT and final course grade results of 272 students from 11 different student cohorts from three different academic semesters. The current study also compared the results for the Communications 1 course to that of an earlier, similar study that was conducted by Richerson and Sutrick (1992). In the earlier case, the researchers examined the predictive ability of a pretest in a business communications course and concluded that although there was a positive correlation, the pretest could not predict final course grades. The current study expanded on the results found in the Richerson and Sutrick study by examining additional prevalent trends found in both studies.

4.1   Descriptive Statistics

The statistical analyses were performed to determine if a) the LDT could predict the final course grades of students in the Communications 1 course in the Centre for Justice Studies, b) the results of the current study were consistent with those of Richerson and Sutrick (1992), and c) the LDT could predict the minimum grade required for a student to pass the course.

A strong correlation between the LDT results and the final course grades from cross tabulating the two Communications 1 scores was not found given the spread of the data within each of the final course grade ranges (see Table 4.1). The absence of a definite concentration of data points in the cross tabulation presented little reason to conclude that the two Communications 1 scores were strongly correlated.

Table 4.1

LDT Results versus Final Course Grades
N = 272

Diagnostic Score	Final Grade				
	A	B	C	D	E
84-83	1				
82-81					1
80-79					
78-77	2	1			
76-75	1	2			2
74-73	5	1	1	1	
72-71	3	3	1		2
70-69	1	3	3		
68-67	1	2	1	5	1
66-65	2	4	6	1	2
64-63	2	1	2	4	
62-61	1	5	2	7	1
60-59	4	1	4	4	3
58-57		3	5	2	6
56-55	2	4	4	5	10
54-53	2	7	3	6	3
52-51	1		3	7	3
50-49		1	7	10	4
48-47		5		8	4
46-45		1	2	7	6
44-43		1	1	2	4
42-41		1	2	2	5
40-39		2		1	5
38-37					4
36-35			1	2	1
34-33			1	1	3
32-31					
30-29					
28-27					
26-25					1
24-23					
22-21					1
Totals	28	48	49	75	72

While the box plot (see Figure 4.1) and the scatter plot (see Figure 4.2) did not indicate a strong linear correlation, these two figures did illustrate, more clearly than the cross tabulation did, that a weaker correlation may exist between the two student scores. In the box plot, the inner quartile ranges for each final course grade range showed a greater concentration of student LDT results compared to the overall dispersion of all LDT results for that corresponding final course grade range.
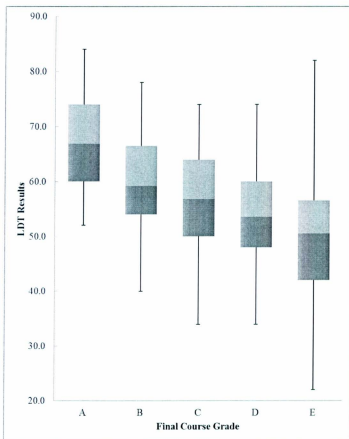
Figure 4.1: Box plot of LDT results compared against final course grades.

The inner quartile range also indicated an upward trend in the final course grades in relation to the LDT results. The students with higher LDT results tended to have higher final course grade scores, and lower LDT results to have lower final grade scores. For example, more students who achieved an LDT score between 60% and 70% achieved a final course grade of A than students who achieved an LDT score between 50% and 60%.

To determine the strength of this weaker correlation between the LDT and final course grade, the relationship was quantified by calculating the Pearson product-moment correlation coefficient. The data in Table 4.2 showed that the Pearson correlation calculated for the two scores was 0.4470, and the value for r-squared was 0.1998. This result is comparable to that found by Richerson and Sutrick (1992), who obtained a correlation of r = 0.34 and an r-squared value of 0.11. The relatively low value for Pearson's correlation found in the current study indicated that the LDT is not a reliable predictor of final course grades, particularly if the goal is to achieve a linear correlation, where a grade on the LDT will be correlated to the same grade level for the final grade (i.e., an A on the LDT will be correlated with an A for the final course grade).

Table 4.2

Summary of Regression Analysis of Student Final Course Grades (N=272)

	Coefficients	Standard Error	t Stat	P-value
Intercept	23.91	5.30	4.51	< 0.05
LDT	0.77	0.09	8.21	< 0.05

Note.

$r = 0.4470$ and $r^2 = .1998$

The correlation between the two Communications 1 scores, while low, was not a random result as the ANOVA data showed in Table 4.3. The low values of r and r-squared did not indicate a strong linear relationship between the two student scores, but the high F value compared to low p-value and low r-squared value indicated that there was a relationship between the two scores. The weakness of the relationship may be the result of another independent and unmeasured variable that affected the Communication 1 students' final course grades.

Table 4.3

ANOVA of relationship between LDT scores and course final grades

	Df	Sum of Squares	Mean of Squares	*F*	*P*
Regression	1	18744.55	18744.55	67.41	< 0.05
Residual	270	75071.20	278.0415		
Total	271	93815.75			

To further test the strength of this possible correlation between the two scores, a linear regression was performed (see Table 4.2). The purpose of this analysis was to determine a regression equation for the best fit line of the LDT versus final course grade data. The equation for the regression line was $y = 0.7667x + 23.906$, and the resulting best fit line was added to the scatter plot (see Figure 4.2). This equation was used to predict final course grades based on student LDT results. These final course grades were compared to actual student final course grades to determine the level of accuracy of the regression equation and, consequently, clarify the nature and significance of this possible correlation.
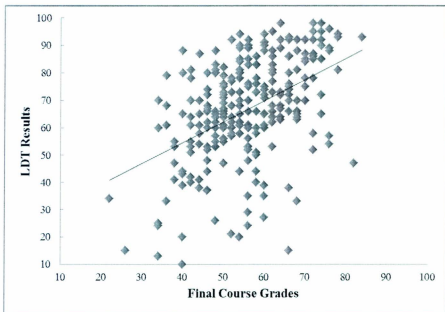
Figure 4.2: Scatter Plot comparing LDT results to final course grades.

Table 4.4 showed that the regression equation's predicted final course grades were misclassified more often than correctly classified (67% of final course grades were misclassified while 33% were correctly classified). For example, of those students who were predicted to score a final course grade of B, only 4 of those students attained that grade, 9 students did better than predicted and achieved an A, and 5 did much worse with 3 receiving an E. This finding confirms the interpretation of the data in the box-plot and the scatter plot provided above. Evidently, the LDT could not determine the final course grades. A Communications 1 student's LDT mark does not guarantee that he or she will achieve that specific mark for a final course grade.

Table 4.4

Frequency of Misclassified Final Grades from Predicted Final Grades

	Final Grade					
Predicted Grade	**A**	**B**	**C**	**D**	**E**	**Totals**
A	0	0	0	0	0	0
B	9	4	1	1	3	18
C	14	19	19	21	9	82
D	5	20	22	38	30	115
E	0	5	7	15	30	57
Totals	28	48	49	75	72	272

	Total	%
Correctly classified	91	33%
Misclassified	181	67%

Richerson and Sutrick (1992) reached a similar conclusion for the relationship between diagnostic test results and final course grades in their study. The number of misclassified final grades was 57.1%. In both studies, a significant number of the misclassified grades were misclassified by more than one grade range away from the predicted final course grade.

The outcomes of the analyses of data did not support the hypothesis that the LDT can predict student final course grades. While a student with a grade of B on the LDT should achieve a final course grade of B, that student will not necessarily finish the Communications 1 course with a grade of B. As Table 4.5 shows, a student with a grade

of B could achieve a grade as high as 98% or a low as 52%. Even though the correlation between the LDT and final course grade in the current study and the pretest test and final course grade in the Richerson and Sutrick (1992) study were too low to make reliable predictions about final course grades from diagnostic test scores, the relationship may be sufficient to make weaker predictions about student course outcomes. The LDT may be able to predict final grades insofar as students with higher LDT results will have higher final course grades, and similarly, those students with lower test results will have lower final course grades.

Further examination of the data in Table 4.4 supported the weaker correlation between the LDT and the students' final course grades. Students who scored in the higher grade ranges on the LDT did have higher final course grades. Similarly, students who scored in the lower grade ranges on the LDT had lower final course grades. The number of misclassifications from the regression equation in the current study, while significant, did reveal two interesting trends in the data.

First, even though the regression equation did not accurately predict final course grades, it did establish the minimum grade a student could likely be expected to achieve. For example, of the 115 students predicted to achieve a final course grade of D, 33.0% did receive a D and 40.8% received a grade better than a D. The percentage that did worse was 26.1%. The majority of students predicted to attain a D did as well or better than their LDT results. Similar results were obtained for those predicted to finish the course with a C and a B. Richerson and Sutrick's (1992) study produced results that were comparable with the researcher's regression equation. For those students predicted to

achieve a D, 86.9% did as well or better. Of those predicted to achieve a C, 88.6% actually did as well or better. And, for those predicted to achieve a B, 68.1% did as well or better. In the current study, no student scored an A on the LDT. In the case of Richerson and Sutrick's study, only 36.6% managed to maintain an A for their final course grade.

Second, the total percentage of students who achieved a final course grade of A in the Communications 1 course increased as the value of the predicted grade increased. For example, of those students predicted to receive an E in the course, none achieved an A. For those students predicted to score a B, C or a D from their LDT results, some were able to achieve a final course grade of A. Comparing those students who were predicted to receive a C and a D, more of the predicted C students were able to achieve an A in the course than those predicted to receive a D (17% and 4% respectively). A similar pattern was found in Richerson and Sutrick's study. For example, the breakdown of grades for students with an E on the pretest was as follows; D = 1.67, C = 6.33, B = 2.00 and A = 0.00. For students with a D on the pretest, the grade distribution was C = 13.30, B = 5.36 and A = 0.00.

While the correlation between LDT and course final grades appeared too low to claim a predictive ability for the results of the LDT, if one is solely interested in a linear correlation, the results of the LDT may establish a baseline for final course grade outcomes. In general, the data from both studies indicated that the results of a diagnostic test may indicate a minimum attainable grade for each student.

A comparison of the LDT results and the actual final course grades in each grade range (see Table 4.5) suggested that LDT scores can be used to predict a minimum attainable final course grade. The majority (89.4%) of the students who scored between 60% and 69% on the LDT achieved a minimum grade of 60%. For those students who achieved a grade in the 70% to 79% range on the LDT, 84.4% of the students achieved a minimum grade of 70%. For those students who scored between 80% and 89% on the LDT, 50% achieved a minimum grade of 80%. Because there were only two students in this group, these results may not be a reflective of the results for a larger population. Excluding those who scored in the 80% to 89% range on the LDT, students who scored passing grades on the LDT were more likely to do as well or better than their LDT score (84% and 89%).

These results were similar to those obtained by Richerson and Sutrick (1992) (see Table 4.6). The frequency and percentage of students that fell within a particular grade range were being reported as ranges because of the method used by Richerson and Sutrick to display their pretest-final grade cross tabulation. The pretest score axis was set in increments of 2 (e.g., 79% - 80%). Since the data in the current study were being extracted from Richerson and Sutrick's cross tabulation, the frequency of students reported for any final grade may have come from either the upper or lower of the two pretest increment values. This presented a problem for those situations where an instance of a student's grade may belong to either the higher grade group or the lower grade group (e.g., A or B). Since the actual pretest grade value was hidden, the current study reported two values. The first included the overlap between a higher and lower grade and the

second excluded counts that occurred in the overlap between grade ranges. The majority of students who achieved a B, C or D on the pretest, in their study, achieved that grade or better in the course. However, the data from Richerson and Sutrick showed that a significant portion (65% to 68%) of those students who scored an A on the pretest did worse than their pretest score suggested they would.

Table 4.5

Analysis of Final Course Grades for Students Who Passed the LDT

		Grade Range							
	10	20	30	40	50	60	70	80	90
LDT: 60% - 69%									
Freq	1	1	4	0	1	*21*	15	13	10
%	1.5	1.5	6.1	0.0	1.5	*31.8*	22.7	19.7	15.2
		Min	**Avg**	**Med**	**Max**			**<60**	**≥60**
	%	15.0	71.6	72.0	98.0			10.6	89.4
LDT: 70% - 79%						.			
Freq	0	0	0	0	4	1	*5*	10	12
%	0.0	0.0	0.0	0.0	12.5	3.1	*15.6*	31.3	37.5
		Min	**Avg**	**Med**	**Max**			**<70**	**≥70**
	%	52.0	82.5	86.5	98.0			15.6	84.4
LDT: 80% - 89%									
Freq	0	0	0	1	0	0	0	*0*	1
%	0.0	0.0	0.0	50.0	0.0	0.0	0.0	*0.0*	50.0
		Min	**Avg**	**Med**	**Max**			**<80**	**≥80**
	%	47.0	70.0	70.0	93.0			50.0	50.0

Table 4.6

Analysis of Grades for Students Who Passed the Richerson and Sutrick
Pre-test

Pre-test Grade	Final Grade	Freq.	%
60s	>= 60%	84 – 66	98.8 - 98.5%
	< 60%	1 - 1	1.2 - 1.5%
70s	>= 70%	98 - 77	88.3 - 90.6%
	< 70%	13 - 8	11.7 - 9.4%
80s	>= 80%	65 - 63	81.3 - 86.3%
	< 80%	15 - 10	18.8 - 13.7%
90s	>= 90%	9 - 6	34.6 - 31.6%
	< 90%	17 - 13	65.4 - 68.4%

The final course grades for Communications 1 students who achieved passing grades did not fall exclusively in the predicted final course grade ranges (see Table 4.5). For those students who scored in the 60% to 69% range on the LDT, 21 of them finished the course in the 60% to 69% grade range, 15 in the 70% to 79% range, 13 in the 80% to 89% range and 10 in the 90% to 100% range. Similar results were produced by those who scored in the 70% to 79% range on the LDT. For these students, 5 finished in the 70% to 79% range, 10 finished in the 80% to 89% range, and 12 finished in the 90% to 100% range. Interestingly, only 2 students scored in the 80% to 89% range on the LDT, and just

1 student achieved a higher grade in the course. However, because only 2 students were in this group, the results may not be reflective of the results for a larger population.

The number of students who scored lower on the final course grade than their LDT results predicted is relatively small. Only 7 (10.6%) of those who scored in the 60% to 69% range on the LDT achieved a lower grade. For those who scored in the 70% to 79% range, only 5 students (15.6%) achieved a grade that was lower than their LDT score. Again, only 2 students scored in the 80% to 89% range, and just 1 (50%) achieved a lower grade for the course.

Richerson and Sutrick (1992) had similar results for those students who did not achieve final course grades equal to or better than their pretest grade. For those who scored in the 80% to 89% range, between 13.7% and 18.8% of participating students scored lower on their final grade. For those who scored in the 70% to 79% range, 9.4% to 11.7% scored lower. For those who scored in the 60% to 69% range, 1.2% to 1.5% of students scored lower.

Excluding the results for the students who scored in the 80% to 89% range on the LDT in the current study and the students who scored in the 90% to 100% range on the pretest in the Richerson and Sutrick (1992) study, the data from both studies support the view that the LDT is able to predict a minimum final course grade with a high degree of accuracy. With fewer than 16% of those who scored between 60% and 80% scoring worse than their LDT results, the LDT score may indicate the minimum final course grade that is most likely to be achievable by a student. The LDT may not be able to

predict a definitive final course grade, but the ability to determine that a student can be expected to do as well or better than the LDT result is beneficial.

Lastly, the current study examined whether the LDT could predict the minimum grade required for a student to pass the Communications 1 course. A comparison of the results charted in Figure 4.3 and Figure 4.4 indicated a very significant reduction in failures from the LDT to the end of the Communications 1 course. The LDT results showed that 63.2% students failed the LDT, but student final course grades showed that only 27% failed the course. Clearly, a significant proportion of students who failed the LDT did pass the Communications 1 course. Therefore, a failing grade on the LTD does not necessarily indicate that that student will fail the Communications 1 course.
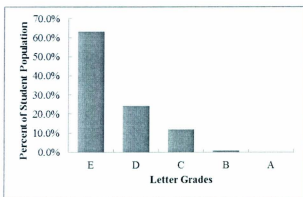
Figure 4.3: Results of LDT grouped by letter grade

All of the course failures in Communications 1 did not come exclusively from those who failed the LDT. Of the 100 students who received a passing grade on the LDT, only 12 (12%) failed the course. The majority of these students achieved a D (7 of the 12 failing students) on the LDT. Therefore, a passing grade on the LDT does not guarantee a

passing grade in the Communications 1 course, especially for those students who achieved a D on the LDT.
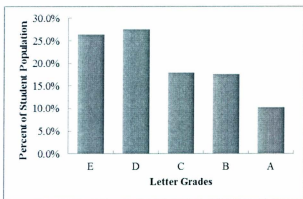
Figure 4.4: Final course grades grouped by letter grade.

Not all of the students who failed the LDT failed the Communications 1 course. The data summarized in Table 4.7 showed that the only grade range in which all students failed the course is the one that had students who failed the LDT with grades in the 20% to 29% range. This may suggest that a diagnostic result in the 20% to 29% range is a predictor of a failing final course grade. Although there were only two students in this group, these results may reflect the results that would be obtained from a larger population. The general trend found in the results for the Communications 1 students was that the probability of achieving a passing final course grade decreased as the LDT score decreased. This trend was also predicted in the regression equation for the Communications 1 course.

Table 4.7

Analysis of Final Course Grades for Students Who Failed the LDT

	Grade Range								
	10	20	30	40	50	60	70	80	90
LDT: 20% - 29%									
Freq	1	*0*	1	0	0	0	0	0	0
%	50.0	*0.0*	50.0	0.0	0.0	0.0	0.0	0.0	0.0

	Min	Avg	Med	Max			<20	≥20	
%	15.0	24.5	24.5	34.0			50.0	50.0	

	10	20	30	40	50	60	70	80	90
LDT: 30% - 39%									
Freq	1	2	*1*	2	2	3	2	0	0
%	7.7	15.4	*7.7*	15.4	15.4	23.1	15.4	0.0	0.0

	Min	Avg	Med	Max			<30	≥30	
%	13.0	48.4	53.0	79.0			23.1	76.9	

	10	20	30	40	50	60	70	80	90
LDT: 40% - 49%									
Freq	1	2	4	*7*	10	20	5	10	0
%	1.7	3.4	6.8	*11.9*	16.9	33.9	8.5	16.9	0.0

	Min	Avg	Med	Max			<40	≥40	
%	10.0	59.7	62.0	88.0			11.9	88.1	

	10	20	30	40	50	60	70	80	90
LDT: 50% - 59%									
Freq	0	4	1	5	*15*	30	22	15	5
%	0.0	4.1	1.0	5.1	*15.3*	30.6	22.4	15.3	5.1

	Min	Avg	Med	Max			<50	≥50	
%	5.0	65.5	66.0	94.0			11.2	88.8	

The number of students who achieved a passing final course grade in the next three LDT grade ranges was greater than the number for the students who were in the 20% to 29% LDT grade range. Those students who scored between 30% and 39% on the LDT had a 38.5% likelihood of achieving a passing grade. Those students who scored between 40% and 49% on the LDT were even more likely than the previous two groups to attain a passing grade: 59.3% had passing grades; whereas 40.7% had failing grades. The results for those students who achieved marks in the 50% to 59% range on the LDT were even higher than the previous three LDT grade ranges. Of those 97 students who received a grade in this range on the LDT, 74.2% achieved a passing grade for the Communications 1 course.

The data identifying a trend for the students who failed the LDT in the current study indicated that students had a greater chance of achieving a final grade above 59% if they achieved a grade in a higher grade range on the LDT. For example, more students in the 50% to 59% range earned a passing grade compared to those in the 40% to 49% range; more students in this range earned a passing grade compared to those in the 30% to 39% range; and more students in this range earned a passing grade compared to those in the 20% to 29% range. Furthermore, a comparison between each LDT grade group showed that as LDT grades increased so did the maximum attainable final course grades. Only 2 (15.4%) students from the 30% to 39% grade range finished in the 70% to 79% grade range, and none of those students finished the course with an 80% or higher grade. For the students in 40% to 49% grade range, 5 (8.5%) finished the course within the 70% to 79% range, 10 (16.9%) in the 80% to 89% range, and none in the 90% to 100% range.

And finally, 22 (22.6%) students from the 50% to 59% grade range achieved a final course grade in the 70% to 79% range, 15 (15.4%) students in the 80% to 89% range, and 5 (5.1%) in the 90% to 100% grade range. These two observations support the view that the students with higher LDT results tend to have higher final course grade scores, and students with lower LDT results to have lower final grade score.

The difference between the number of students who did better on their final course grade than their LDT scores indicated that the lower the LDT score, the greater the possibility of ending the course with a lower grade. This was especially true of those students who scored in the 20% to 29% and 30% to 39% grade ranges. Students in the 30% to 39% grade range had a 23.1% likelihood of receiving a lower grade and those in the 20% to 29% grade range had a 50% likelihood of receiving a lower final course grade.

The higher probability of obtaining a lower final course grade than the LDT score may be the result of the increased workload of those students to complete the Communications 1 course requirements. One could assume that a student who achieves a higher mark on the LDT should also achieve a higher mark in the Communications 1 course because the person would have more knowledge of the content and could concentrate on learning the material he or she does not know or does not know well. On the other hand, the person who achieved a lower grade on the LDT would have more of the material to learn, so he or she would likely not do as well in the course, compared to the student who achieved a higher grade on the LDT.

While the analysis of the data for the current study did not provide definitive support for the existence of a minimal LDT grade that would be required in order to provide students with a chance of passing the Communications 1 course, the analysis did suggest that a grade below 30% was a tenable cut-off point. First, the data trend for the current study indicated that as the LDT grade decreased, the probability of achieving a passing grade decreased. As the LDT score dropped from the 50% to 59% grade range to the 30% to 39% grade range, the probability of passing the course dropped from 74.2% to 38.5%. Therefore, a student with an LDT score in the 20% to 29% range appeared to have even less of a chance to pass the course than the student with an LDT score in the 30% to 39% grade range. Second, although the regression equation for the current study did not accurately predict actual final course grades, it did establish a minimum final course grade that is likely to be achieved by a student based on that student's LDT score. The predicted grades based on LDT results (see Figure 4.5) formed by the regression equation were similar to that shown in the actual data (as student LDT scores decreased, the probability of passing the course decreased). The lower the LDT score, the lower the predicted score will be. For example, a student with an LDT score of 20% was predicted to finish the course with a 39.2%, while a student with a score of 40% was predicted to finish with 54.6%.

However, there were insufficient data in the Richerson and Sutrick (1992) study to make a useful comparison with the current study in this regard because the Richerson and Sutrick study did not have students in the 20% to 29% grade range on the pretest (see

Table 4.8)[2]. Rather, the lowest grade achieved on the pretest in the Richerson and Sutrick study was 38%, and only one student achieved this grade and subsequently passed the course.
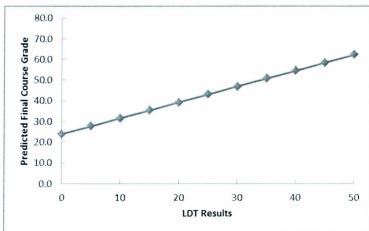
Figure 4.5: Final Course Grades computed from LDT Results

While the correlation between the LDT scores and final course grades was weak ($r = 0.44$), the LDT results could be used to establish a minimum grade that is likely to be achieved by a student in the Communications 1 course. The data also suggested that the higher the LDT results, the higher the possibility that a student will pass the course. For example, among students who scored a grade of 60% or higher on the LDT, only 12 failed the course. Of these 12 who failed the course, only 7 of 66 students, who scored between 60% and 69%, failed the Communications 1 course. For those who scored between 70% and 79% only 4 of the 32 students failed the course. And, for those students

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[2] Data for this table were calculated from the cross tabulation in Richerson and Sutrick's study. As noted previously, grade ranges are reported here because of the method used by Richerson and Sutrick to report data.

who scored between 80% and 89%, only 1 of the 2 students failed the course. There are

no students who scored higher than 89% on the LDT.

Table 4.8

Students Who Failed Richerson and Sutrick Pretest

Grade Range	Total Students	Did Better (Freq.)	Did Better (%)
50s	38	36	94.7%
	53	50	94.3%
40s	9	9	100.0%
	15	13	86.7%
30s	1	1	100.0%

The data describing those who failed the LDT indicated that as the grade level

decreased, the probability of achieving a passing final course grade also decreased. This

decrease was particularly dramatic as the LDT score dropped from the 40% to 49% range

down to 30% to 39% range. Those who scored in the 40% to 49% range on the LDT only

11.9% failed, but 23.1% failed who scored in the 30% to 39% range on the LDT. While

there were only 2 students in the 20% to 29% range for LDT scores, the likelihood of a

student in this LDT range passing the course appeared rather remote. An LDT result less

than 30% appeared to be the level at which students are highly unlikely to pass the

course.

It is important to recognize that it was possible for those who passed the LDT to

receive a failing final course grade (see Table 4.4) even if this was highly unlikely. It was

also possible to pass the course even if the student had a failing grade on the LDT, but the probability of passing decreased the lower the LDT score was.

4.2   Summary of Results

The current study confirmed the stated results of Richerson and Sutrick's (1992) study. While Richerson and Sutrick found a correlation of $r = 0.34$ between their pretest and final grades, the current study found a slightly higher correlation of $r = 0.44$ between the LDT and course final grades. The grades on an individual basis or a case-by-case basis were too widespread to have a significant predictive value for determining any individual student's potential final grade.

However, these two studies achieved similar results when considering larger populations. When students were viewed as groups defined by letter grade (i.e., A, B, C, D, and E), an interesting pattern appeared. While not explicitly stated nor concluded in the Richerson and Sutrick (1992) study, the majority of the students who achieved a B, C, or D on the pretest achieved that grade or better in the course. The current study confirmed this for the students who achieved a C or a D on the LDT. Only two students achieved a B on the LDT—one passed the course and one failed the course, so no generalizations could be made for this group for the current study. For the students who were in those grade categories on the pretest (B, C, or D) or LDT (C or D), the likelihood of their grades staying the same or improving was above 80%. This is positive information for the students and the teachers because the LDT is able to predict with a high degree of confidence a minimum grade a student is able to achieve in the course.

The current study also showed that 100% of the students who achieved between 20% and 29% on the LDT failed the course. These results could suggest that a student who achieves a grade in this range on the LDT will fail the course. Even though the sample size in this range was low, the results could be reflective of a larger population. Because the lowest score on the pretest for the Richerson and Sutrick (1992) study was 38%, no comparison could be made between these two studies to confidently predict a minimum grade required on the LDT to pass the course. However, the current study can, with confidence, state that a student who achieves a grade in the 30% to 39% range on the LDT may pass the course and is not guaranteed to fail the course. Thirteen students achieved marks in this range, with 38.5% passing the course. The Richerson and Sutrick (1992) study had only one student in this grade range, and that student passed the course.

A passing grade on the LDT does not guarantee that a student will pass the course, and a failing grade on the LDT does not guarantee that a student will fail the course. The higher the grade is on the LDT, the greater the chance is for a student to pass the course. As the grade ranges increase on the LDT, the percentage of those who pass the course also increases.

Chapter 5.   Discussion, Conclusions, Limitations, and Implications for Further Research

5.1   *Discussion*

A standardized test "is a test that is administered and scored in a consistent, or 'standard', manner" and "[is] designed in such a way that the questions, conditions for administering, scoring procedures, and interpretations are consistent and are administered and scored in a predetermined, standard manner" (The Free Dictionary, 2012, para. 1). These standardized tests are widely used across professions and educational institutions as a method to determine a person's competency in a particular area of study.

Educational institutions rely heavily on standardized tests for several reasons. Some of these reasons include a) to determine a student's or an applicant's eligibility or suitability for particular programs or courses, b) to stream students into particular programs or courses, and c) to assess the quality or effectiveness of a course, program, or school. Educational institutions are not alone in their reliance on these types of tests. Numerous justice-related occupations use these tests as part of the hiring process. Also, many of the tests include writing and comprehension components. If applicants do not pass these standardized tests, they will not be hired.

The Centre for Justice Studies at Loyalist College—one of Ontario's 24 Colleges of Applied Arts and Technology—administers a Language Diagnostic Test (LDT) at the beginning of the Communications 1 course in semester 1 to determine a) a student's competency level in English, b) whether a student should receive an exemption from the course, and c) whether a student should seek remedial help for the course. The LDT is a

multiple-choice test, consisting of 50 questions that cover the following 5 content areas:

a) spelling, b) punctuation, c) grammar, d) diction and usage, and e) sentence structure.

All five of these areas are taught and assessed in the Communications 1 course. All

Communications 1 teachers believe that the test measures what it is intended to measure

and, therefore, are justified in using the results to grant exemptions and to direct students

to seek remedial help.

Communications skills are listed as one of the three academic skills that provide

the basic foundation for people to be hired, to maintain their job, and to progress on their

job (CALSCA, n.d.). Employers in justice fields agree and, evidently, place great

importance on communication skills. People who work in justice fields are often required

to write documents relating to legal matters—documents that are often presented in court.

In such cases, there is no disputing that the writing must be comprehensible, concise, and

accurate. Therefore, it is importance for the Communications 1 course to determine if the

LDT misidentifies those who deserve exemptions and those in need of remedial help. If

students are given exemptions or directed (or, more importantly, not directed) to seek

remedial help, the students will not be allowed the proper opportunity to succeed in

achieving a job in the justice field or to complete the written legal work that will be

required of them. If this is the case, a great injustice will have occurred.

The literature on standardized testing provides varied perspectives on their

efficacy and appropriateness. Some studies have concluded that the tests are not reliable,

and other studies have concluded the opposite. For example, Kohn (2000) noted that

standardized tests are not objective enough and may not be reflective of the student's

actual ability. He further noted that these tests cannot predict future success of the student and do not provide a good indication of a student's thinking or aptitude. Bridgeman, Burton, and Pollack (2008) studied the predictive ability of the SAT I on college performance and found that high school grade point average (HGPA) is a better predictor. Smittle (1995) reached the same conclusion when the researcher examined the predictive ability of the Computerized Placement Test (CPT) and other factors like race and gender. Wood and others (1990) examined the predictive ability of Form E of the Nelson-Denny Reading test and other indicators of academic success and concluded that HGPA was the best predictor of success in college. Alternatively, Adebayo (2006) found that the vocabulary score on the NDRT was a significant predictor of academic success of adult learners in a first-year social work program. Hoffman and Ziegler (1978) concluded that the California Language Test (CLT), which includes subtests measuring punctuation, capitalization, and word usage, should be used as a preliminary screening device. Bissell and Collins (2001) found that there was a relationship between a 20-question grammar pretest and a writing assignment given to journalism students and the students' college GPA. Also, Olson and Martin (1981) found that an objective test, consisting of 40-multiple-choice questions that evaluated items such as grammar and sentence structure, was the best assessment to use for English credit courses to guide students into the appropriate programs and courses. Richerson and Sutrick (1992) attempted to determine if a pretest in a basic business course could predict final course grades. The researchers found a positive correlation between the pretest and final course grades, but because the

correlation was too low (r = 0.34) the pretest was not a reliable tool to predict final course grades.

The current study attempted to determine if the LDT measured what it was intended to measure along with comparing the results found in the Richerson and Sutrick (1992) study to the results of the current study. It attempted to answer the following three questions: a) Can the Language Diagnostic Test predict the final course grades of students in the Communications 1 course in the Centre for Justice Studies?; b) Are the results of the current study consistent with those of Richerson and Sutrick?; and c) Can the Language Diagnostic Test predict the minimum grade required for a student to pass the course?

Although Richerson and Sutrick (1992) did not make comments about the generalizability of their results to other contexts, the current study did take their data into account and compared their data to the data in the current study. Richerson and Sutrick examined the linear correlation between the pretest results and final course grades. The researchers did not note the significance of the grade ranges on the pretest to the final course grades. The data from the Richerson and Sutrick study support the findings of the current study. The current study found that the LDT can predict, with confidence, a minimum course grade, that not everyone who passes the LDT will pass the course, that not everyone who fails the LDT will fail the course, and that the higher a grade is on the LDT, the higher a grade will be in the course.

The students in the Communications 1 courses at Loyalist College should achieve at least the grade they achieved on the LDT or higher. The LDT evaluates the students on

their knowledge of material (i.e., spelling, punctuation, grammar, diction and usage, and sentence structure) at the beginning of the semester, and the very material on which they are being evaluated is taught, practiced, and evaluated during the semester. Therefore, the students should have learned the material they did not know or understand when they completed the LDT. After the students receive their individual scores on the LDT— approximately week two of the semester—they are counselled to seek remedial help or to complete extra work on the areas on which they received low scores on the LDT. If the students sought extra help or completed the extra work, their marks in the course would likely be higher than their marks on the LDT, and these actions could have accounted for the results found in this study.

5.2   Conclusions

The current study found that there is a positive correlation of r = 0.44 between the LDT and the final course grades. The results are similar to those found by Armstrong (2000) who found a positive correlation (r = 0.35) between placement test scores and course grades for English and mathematics. Similarly, Mattern and Packman (2009) found a positive correlation between ACCUPLACER test scores and success defined by the student obtaining a C or higher (r = 0.34) and by the student obtaining a B or higher (r = 0.42). The current study also confirmed the results of the Richerson and Sutrick (1992) study. Richerson and Sutrick found a correlation of r = 0.34 between the pretest and the final course grades. The current study reached the same conclusion as Richerson and Sutrick in that although there is a positive correlation between the LDT and the final

course grades, the correlation is too weak to have any predictive ability for final course grades.

The current study discovered some interesting parallels between data from the two studies. The data indicated that a pattern existed when the results were viewed as groups defined by letter grades (i.e. A, B, C, and E). The current study showed that of the students who achieved grades in the C or D ranges on the LDT, 80% of them achieved that grade or higher in the course. The Richerson and Sutrick (1992) study also showed this relationship. Over 85% of the students in their study who achieved grades in the B, C, or D ranges on the pretest achieved that grade or higher in the course. The current study can confidently say that students are likely to do as well or better in the course than they did on the LDT if they achieved a C or a D on the LDT.

The current study found that all students who achieved between 20% and 29% on the LDT were not successful in the course. This could suggest that a minimum grade required on the LDT to pass the course would be above 29%. Although the current study had only two students in that grade range, the results are expected to be reflective of the larger population. The regression line predicted that a student who achieves a grade in that grade range on the LDT will achieve between 39.3% and 46.1 % in the course. Therefore, the current study can conclude with confidence that a student who achieves below 30% on the LDT will not be successful in the Communications 1 course.

Lastly, the current study found that a passing grade on the LDT does not guarantee that a student will achieve a passing grade in the course, and a failing grade on the LDT does not guarantee that a student will achieve a failing grade in the course.

However, there was a strong relationship between the LDT results and the final course grades of those who failed the LDT. As the LDT grade ranges increased, the probability of achieving a passing grade in the course also increased. Of those who achieved in the 30% to 39% range on the LDT, 38.5% passed the course, of those who achieved in the 40% to 49% range on the LDT, 59.3% passed the course, and of those who achieved in the 50% to 59% range on the LDT, 74.2% passed. Therefore, the current study can confidently conclude that the higher a student achieves on the LDT, the higher the student's likelihood of passing the course.

Considering that the results of the study indicated that the higher the students' grades are on the LDT, the higher the students' grade will be in the course, one can justify using the LDT to determine individual student's competency in English and the course material; therefore, the LDT could be used to direct students to seek remedial help. Also, considering that only two students were near the exemption grade level, the results cannot support nor refute the use of the LDT as an exemption tool for the Communications 1 course. One can assume that because all the components on which the students are being evaluated on the LDT are also being taught and assessed in the course, the LDT would be a good tool to use to determine exemptions for the course.

5.3   *Limitations*

The current study was limited in that it included results from only the Communications 1 course in one program in one college. Comparing data from other courses in other programs in other colleges would allow for a larger sample size. Having a larger sample size would reduce or eliminate the possibility of teacher and/or

institutional bias and increase the statistical validity. Another limitation of the current study was the lack of student information available to the researcher. The available information did not allow the researcher to consider the following as factors for the current study: attendance of students in the classroom, the number of evaluations not completed by the students in the course, high school grade point average, student motivation, and personal issues and social factors—marital status, number of children, race, and gender. Each of these factors could have potentially impacted the students' performance in the Communications 1 course.

5.4   *Implications for Further Research*

The current study included results from 272 students who were enrolled for a single semester in one of the Communications 1 courses over three years. These students were taught and evaluated in the areas of spelling, punctuation, grammar, diction and usage, and sentence structure. Given that these students were taught and evaluated on the components that are included on the LDT, one would assume that they would achieve higher grades in the course than the grades they achieved on the LDT. In many cases the students did as well or better than the grades they achieved on the LDT; however, although the number is small, unfortunately, some did worse than their grades on the LDT. Further research should consider factors that could contribute to the marks either staying the same or declining.

Some of the conditions that should be considered are attendance of students in the classroom, the number of evaluations not completed by the students in the course, high school grade point average, student motivation, and personal issues and social factors—

marital status, number of children, race, and gender. Attendance is critical in the Communications 1 course. All material on which students are evaluated is taught, explained, and practised in the class. If students miss a significant number of classes and if students do not complete all the evaluations for the course, the students are likely not going to do well in the course.

HGPA is another contributing factor that could provide relevant information for the researcher in determining the likelihood of a student's success in the course. Bridgeman, Burton, and Pollack (2008), Smittle (1995), and Wood and others (1990) concluded that the high school grade point average was the best predictor of student success in college. A comparison of HGPA, LDT scores, and final course grades would provide relevant information to determine the best predictor of student success in the Communications 1 course.

Student motivation should also be considered. Although students may have good intentions when beginning a course and plan to put their best effort forward in order to do well in the course, some students lose their motivation to try to do well. If students are not motivated to do well, whether intrinsically or extrinsically, and, therefore, do not put forth as much effort as they originally had planned, they may see their course grade decline from that of their LDT grade.

Lastly, considering personal issues and social factors would provide the researcher with data to examine any possible relationships between those students who are and are not successful in the course, especially for those who pass the LDT but fail the course. As Bissell and Collins (2001) pointed out, attitudes and experience should be

considered when determining contributing factors for students' success. Personal factors can manipulate much of a person's thoughts and time, so one would expect personal issues to play a role in a student's grade declining from the grade he/she had achieved on the LDT. Many students must deal with issues regarding finances, children, friendships, social media, and the list continues. Personal issues may cause students to spend more time on other issues and neglect their studies.

For the purpose of future research in this area, it is recommended that researchers consider the above-mentioned factors in an effort to account for the anomalous decreases in course grades. Not only will this further research be beneficial for this one course, but the results will be beneficial to other institutions and organizations that use similar tests. Institutions would be able to determine methods or tools to use to assist those who would likely be successful if they did not have other factors interfering with their course work. For instance, a college could develop programs or assistance that would be readily available for students who are struggling with, for example, financial issues or childcare issues. Organizations that hire employees based on successful results on a standardized test would have evidence that could explain why certain employees may not be performing as well as they are expected. The organization could also consider implementing support mechanisms to assist their employees.

Considering that many professions use standardized tests to determine a person's competency level in a particular area, it is important that research continues in order to ensure that the tests are in fact measuring what they are intended to measure and that all

possible factors that could contribute to a person's decline in the course or on the job be considered so that people, institutions, and organizations will be successful.

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Appendix A

SECTION 1: SPELLING

Instructions: *Select the option in which **both** words are spelled correctly.*

1. _____ not going to believe _____ coming to the party!

     a) Your…whose
     b) You're…whose
     c) Your…who's
     d) You're…who's

2. The psychiatrist did not _____ the nature of the boy's _____.

     a) perceive…grief
     b) perceive…greif
     c) percieve…grief
     d) percieve…greif

3. The man is a _____ witness, so his testimony will be very _____.

     a) credable…valueable
     b) credible…valuable
     c) credable…valuable
     d) credible…valueable

4. The dog is not _____; it is our _____.

     a) ours…neighbour's
     b) our's…neighbour's
     c) ours…neighbours
     d) our's…neighbours

5. The cough _____ is in _____ 3.

     a) medicine…isle
     b) medicine…aisle
     c) medecine…isle
     d) medecine…aisle

6. When _____ a business letter, you should conclude with "Yours _____."

    a) writting…sincerely
    b) writting…sincerly
    c) writing…sincerely
    d) writing…sincerly

7. The _____ of the _____ made the room seem larger than it was.

    a) height…cieling
    b) hieght…cieling
    c) hieght…ceiling
    d) height…ceiling

8. You should continue trying _____ you _____.

    a) untill…suceed
    b) until…suceed
    c) untill…succeed
    d) until…succeed

9. I _____ that you take advantage of this great _____.

    a) reccommend…opportunity
    b) reccommend…oporunity
    c) recommend…opportunity
    d) recommend…oportunity

10. Please forward any _____ information to the department _____.

    a) relevant…secretary
    b) relevent…secretary
    c) relevant…secretary
    d) relevent…secretary

SECTION 2: PUNCTUATION

Instructions: *Select the option that contains the most appropriate punctuation.*

11. The move was a _____ was broken.

    a) disaster, my favourite vase, along with some antique china,
    b) disaster. My favourite vase, along with some antique china,
    c) disaster, my favourite vase along with some antique china
    d) disaster. My favourite vase along with some antique china

12. Our Communications teacher asked, _____.

    a) "have you been to CAL lately"?
    b) "have you been to CAL lately?"
    c) "Have you been to CAL lately"?
    d) "Have you been to CAL lately?"

13. My car broke _____ had to take the bus.

    a) down, so I
    b) down; so I
    c) down so I
    d) down. So I

14. I ran into Mrs. _____ the mall.

    a) Henderson, my favourite teacher at
    b) Henderson, my favourite teacher, at
    c) Henderson my favourite teacher, at
    d) Henderson my favourite teacher at

15. After all of the guests had _____ began to clean up.

    a) gone home; Sarah
    b) gone home. Sarah
    c) gone home, and Sarah
    d) gone home, Sarah

16. Claire asked _____.

    a) why I wasn't going
    b) "why I wasn't going?"
    c) "Why I wasn't going"
    d) "Why I wasn't going"?

17. Alice Munro's short story _____ appeared in this week's edition of
_____.

    a) "Chance"...<u>The New Yorker</u>
    b) <u>Chance</u> ... "The New Yorker"
    c) <u>Chance</u>...<u>The New Yorker</u>
    d) "Chance" ... "The New Yorker"

18. "Take your _____ we will get started."

    a) seats," the professor instructed, "And
    b) seats, the professor instructed, And
    c) seats," the professor instructed, "and
    d) seats," the professor instructed, "and

*19. Paul spends his free time writing, drawing, and playing his
_____ volunteers at the local hospital.

    a) guitar, furthermore, he
    b) guitar; furthermore, he
    c) guitar, furthermore; he
    d) guitar furthermore he

20. *Law & Order* is on three times a _____ Tuesday at 10pm,
and Wednesday at 10pm.

    a) week: Monday at 9pm,
    b) week, Monday at 9pm,
    c) week; Monday at 9pm,
    d) week. Monday at 9pm,

SECTION 3: GRAMMAR

Instructions: *Select the option that is most grammatically correct.*

21. Neither Dr. Blake nor Dr. Wood _____ that the results of the test
    _____ anything to worry about.

    a) think…is
    b) think…are
    c) thinks…are
    d) thinks…is

22. Required for this course ____ a dictionary and a thesaurus, both of which
    ____ on sale at the campus bookstore.

    a) is…is
    b) are…are
    c) is…are
    d) are…is

23. The jury _____ that 15 years in a maximum-security facility _____ an
    appropriate punishment for the crime.

    a) feels…are
    b) feel…are
    c) feels…is
    d) feel…is

24. Paul _____ an accident since he _____ driving until he
    sideswiped a truck last week.

    a) hasn't had…began
    b) hadn't had…began
    c) hasn't had…begun
    d) hadn't had…had begun

25. We had _____ over four miles, so we _____ very tired.

    a) run…were
    b) ran…were
    c) ran…was
    d) run…was

26. If you _____ been there, I don't know what I would have done.

    a) hadn't of
    b) wouldn't of
    c) hadn't
    d) wouldn't have

27. I have _____ experience than _____, but I have more education.

    a) less…he
    b) less…him
    c) fewer…him
    d) fewer…he

28. Allan did _____ on the test, but Chris did _____.

    a) good…best
    b) good…better
    c) well…best
    d) well…better

29. The woman worked _____ and _____.

    a) quietly…efficient
    b) quietly…efficiently
    c) quiet…efficiently
    d) quiet…efficient

30. After _____ carpet all day, my dad spent the evening _____ on the couch.

    a) lying…lying
    b) laying…laying
    c) lying…laying
    d) laying…lying

SECTION 4: DICTION AND USAGE

Instructions: *Choose the words or phrases that are most appropriate according to meaning, style, and proper usage.*

31. Though the teacher was not _____ of Ann's cheating, Ann's _____ compelled her to confess.

    a) conscience...conscious
    b) conscience...conscience
    c) conscious...conscious
    d) conscious...conscience

32. Jenn is going ___ the party, then Alice will be going, ___.

    a) too...to
    b) to...too
    c) to...to
    d) too...too

33. _____ are more students in Mr. Brown's class _____ in Ms. Green's class.

    a) Their...than
    b) There...than
    c)- Their...then
    d) There...then

34. I was _____ at every college I applied to _____ one.

    a) accepted...accept
    b) accepted...except
    c) excepted...except
    d) excepted...accept

35. If you have grasped the _____, you will _____ the test.

    a) basic fundamentals...successfully pass
    b) fundamentals...successfully pass
    c) basic fundamentals...pass
    d) fundamentals...pass

36. There are _____ possibilities, so be _____ consider them all.

     a) a lot of...sure and
     b) a lot of...sure to
     c) many...sure and
     d) many...sure to

37. The teacher _____ from John's complaint that Justin's behaviour
    had a negative _____ on their presentation.

     a) inferred...affect
     b) inferred...effect
     c) implied...affect
     d) implied...effect

38. Though there is _____ pollution today than 10 years ago, the _____
    is still too great.

     a) less...amount
     b) less...number
     c) fewer...amount
     d) fewer...number

39. _____ you are sick the day of a test, it may be postponed
    _____ you are well enough to write it.

     a) In the eventuality that...until such time as
     b) In the eventuality that...until
     c) If...until
     d) If...until such time as

40. The book was _____ easy to follow because I had _____ seen
    the movie version.

     a) real...already
     b) really...already
     c) real...all ready
     d) really...all ready

SECTION 5: SENTENCE STRUCTURE

Instructions: *Choose the phrasing that **best** completes the sentence. For the last three items, choose the sentence that expresses the thought most effectively.*

41. _____, Tanya's cell phone began to ring.

    a) Leaving the theatre
    b) As she was leaving the theatre
    c) Having left the theatre
    d) While leaving the theatre

42. Joe would prefer to vacation on the beach rather than _____.

    a) the mountains
    b) in the mountains
    c) mountains
    d) vacationing in the mountains

43. On the first day of classes, students were asked _____.

    a) to sign their registration forms and to buy their books
    b) to sign their registration forms and buy their books
    c) to sign their registration forms and start buying their books
    d) to please sign their registration forms and buy their books as soon as possible

44. _____ I am terrified of spiders, spider webs fascinate me.

    a) Because
    b) Since
    c) Although
    d) As

45. The furniture looks _____ it hasn't been dusted in weeks.

    a) like
    b) as
    c) as if
    d) as like

46. Marge not only exercises every day _____.

     a) but she takes vitamin supplements, too
     b) and, in addition, she takes vitamin supplements
     c) but also takes vitamin supplements
     d) and she takes vitamin supplements

47. In tennis, a serve is _____.

     a) when one's opponent begins the game
     b) the stroke used by an opponent to begin the game
     c) where one's opponent begins the game
     d) when the game is begun by one's opponent

48. a) Susan makes wonderful spaghetti, which is why I like going to her house
      for dinner.
    b) I like going to Susan's house for dinner on account of she makes
      wonderful spaghetti.
    c) The reason I like going to Susan's house for dinner is because she makes
      wonderful spaghetti.
    d) Because Susan makes wonderful spaghetti, I like going to her house for
      dinner.

49. a) He kicked the ball barely 3 feet.
    b) He barely kicked the ball 3 feet.
    c) Barely, he kicked the ball 3 feet.
    d) He kicked, barely, the ball 3 feet.

50. a) Being naturally athletic, gym class was easy for me.
    b) Gym class was easy for me, being naturally athletic.
    c) Gym class, being naturally athletic, was easy for me.
    d) Being naturally athletic, I found gym class easy.

Appendix B

Student Grades in Communications 1

Student Code	Diagnostic Score (%)	Letter Grade	Course Final Grade (%)	Letter Grade
B01	48	E	80	B
B03	58	E	60	D
B04	42	E	81	B
B05	72	C	98	A
B06	58	E	83	B
B07	68	D	81	B
B08	66	D	74	C
B09	68	D	66	D
B10	48	E	81	B
B11	68	D	92	A
B12	50	E	60	D
B13	60	D	91	A
B14	34	E	70	C
B15	78	C	94	A
B16	54	E	94	A
B17	58	E	83	B
B18	56	E	90	A
B19	74	C	90	A
B20	50	E	67	D
B22	74	C	92	A
C02	60	D	61	D
C04	58	E	76	C
C05	48	E	60	D
C06	60	D	72	C
C07	52	E	60	D
C08	56	E	66	D
C09	42	E	40	E
C10	62	D	81	B
C11	64	D	92	A
C12	38	E	55	E
C13	58	E	51	E
C14	66	D	76	C
C15	54	E	61	D
C17	44	E	54	E

Student Grades in Communications 1 (Cont.)

Student Code	Diagnostic Score (%)	Letter Grade	Course Final Grade (%)	Letter Grade
C18	46	E	62	D
C19	62	D	66	D
C20	56	E	24	E
C22	46	E	53	E
C23	46	E	66	D
C24	66	D	92	A
C25	70	C	75	C
C26	64	D	68	D
C27	48	E	64	D
C28	70	C	85	B
C29	78	C	93	A
D01	72	C	92	A
D02	58	E	78	C
D03	64	D	98	A
D04	52	E	68	D
D05	60	D	94	A
D06	50	E	69	D
D07	46	E	52	E
D08	36	E	33	E
D10	54	E	80	B
D11	54	E	61	D
D13	46	E	66	D
D14	60	D	65	D
D15	52	E	60	D
D16	50	E	61	D
D17	70	C	92	A
D18	56	E	61	D
D19	50	E	64	D
D21	62	D	62	D
D22	74	C	65	D
D23	40	E	43	E
D24	42	E	70	C
E01	52	E	60	D
E02	66	D	74	C
E03	74	C	95	A
E04	36	E	79	C

Student Grades in Communications 1 (Cont.)

Student Code	Diagnostic Score (%)	Letter Grade	Course Final Grade (%)	Letter Grade
E05	50	E	67	D
E06	44	E	70	C
E07	56	E	61	D
E08	56	E	60	D
E09	70	C	70	C
E10	38	E	47	E
E12	72	C	86	B
E14	72	C	95	A
E15	50	E	76	C
E16	58	E	50	E
E17	66	D	86	B
E18	52	E	92	A
E19	68	D	70	C
E21	64	D	89	B
E23	52	E	77	C
E24	50	E	47	E
F01	50	E	79	C
F02	68	D	65	D
F03	62	D	68	D
F05	72	C	52	E
F06	68	D	63	D
F08	50	E	71	C
F10	64	D	67	D
F11	44	E	58	E
F12	70	C	87	B
F13	64	D	72	C
F14	44	E	38	E
F15	56	E	75	C
F16	46	E	60	D
F17	46	E	37	E
F18	42	E	78	C
F19	52	E	64	D
F20	76	C	88	B
F21	50	E	60	D
F22	60	D	71	C
F24	74	C	85	B