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Editorial

Competition vs. Collaboration

Donald G. Perrin

Competition is newsworthy because there are winners and losers. In the end it is destructive for participants because there is only one winner. That means that, to some degree, all but one are losers. To have more than one winner, it is necessary to have a series of different contests. Each contest is governed by a set of rules, and judges determine compliance with those rules. Some participants may cheat or bend those rules to their advantage. It is appropriate to take advantage within the rules. Unfortunately, to cheat may be the only way to win, and if others sense that the winner is cheating, they also may cheat in an attempt to be the winner. The question is not about ethics, but how to cheat and not be caught.

Collaboration involves people working together to achieve a common goal. This is a constructive process where success is shared by many. The collective contributions of all participants are focused on a common goal and the result may be greater than a sum of its parts. Participants help each other to ensure success and the effort expended is constructive, productive and not destructive. All who participate can be winners. There is less incentive to cheat.

In an educational setting, the competition model sets up the teacher as a coach and referee. They grade students according to their performance on tests and activities. It is in the testing and activities that cheating occurs. The top students are rewarded for exceptional performance. And by definition, half the students perform below average. This is a negative reward.

Huge sums of money are spent to detect cheating, and many of our top students (and teachers) have been damaged by being caught. Perhaps it is the system of education that is at fault. Perhaps there is a better way to use our human resources, both teachers and students. Perhaps there are other ways to measure progress and proficiency that are not amenable to cheating. Creative projects and problem solving where there is not a single answer fall into this category.

Teachers using the collaborative model are mentors, tutors, and consultants. They establish criteria to be achieved by every student. Some teachers involve students in setting the criteria. Faster and more able students help those who are behind. By having students helping each other, they extend the “teaching” power and raise overall class performance. The goal is to get everyone “above the bar” and avoid a sense of failure for slower and less able students. Failure at any level is a waste of academic resources for both teachers and students.

Distance learning, often called flexible learning because of its ability to serve anybody-anywhere-anytime, unshackles the lockstep schedules and fixed curriculum of the traditional brick-and-mortar classroom. Using a diagnostic-prescriptive model, a great variety of learning modules can be used to meet individual needs. In this way, students can acquire the knowledge and skills required to participate effectively in group activities, raising the quality of the learning experience for the entire class. The superior record keeping, delivery, and testing tools in learning management systems (LMSs) enable teachers to support a diversity of student needs and provide a more productive educational experience for their students. In this way, we satisfy the needs of almost all of our students rather than picking and rewarding the winners. Students of exceptional ability will always stand out, and these same students can be some of our best “teachers” for their peers who are struggling. Instead of cutting off the bottom half as below average, we can raise overall performance to a higher level.

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Editor's Note: In brick-and-mortar universities, almost half of the students who complete courses for their doctorate do not finish their dissertation. These are called ABDs – All But Dissertation. Life's complexities and events cause some to drop out. Others are overwhelmed by the tasks of research and writing and the self-discipline involved. It is for this group that this paper is directed, with one additional condition – it specifically addresses needs of the *online* doctoral student.

Dissertation Advice for Online Doctoral Students

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Abstract

The doctoral dissertation is considered the ultimate academic challenge and online students are excited and anxious about their new endeavor. There are numerous concerns and questions involving how to develop a realistic life balance due to multiple responsibilities involving a job, relationships and school work. Academic decisions must be made about selecting a valuable topic to enhance professional opportunities. This discussion will share practical advice on working successfully with a dissertation Chair, writing fluently, balancing reading and writing, and conducting a literature review. The advice will help make the doctoral journey a positive and productive educational experience.

Keywords: dissertation, feedback, work life balance, mind maps, literature review

> "*Getting the doctorate is always much more than simply completing the research ---in reality it is about becoming and being a scholar*." (Walker & Thomson, 2010, p. 2)

Introduction

Regardless whether the doctoral program is a traditional on campus program or an online program writing a doctoral dissertation is a daunting task. All doctoral students face many challenges associated with dissertation research. While there is an additional challenge often faced by online students, there are also several advantages to working on a doctorate in the online environment. This article discusses the challenges of balancing multiple obligations while completing an online doctorate. Airey (2012) contended that "finding strategies to overcome these challenges is the key" (p. 115). Several benefits to working on a dissertation in the online environment are described.

Online Student Challenges

Work-life-school balance. Traditional university doctoral students attend campus universities and often pursue the degree as a continuous progression from high school to Bachelors degree, to Masters degree, to Doctorate. Of course not everyone has the finances, scholarships, or desire to be a "professional student". About 40% of college students are now consider nontraditional students (Luzer, 2011). The National Center for Education Statistics defined nontraditional students to include students who work full time, who are raising family, or both. Online universities can be an excellent option for the nontraditional doctoral student.

Winings (2008) identified five strategies for achieving work-life-school balance:

1. "know yourself"—Balance is an individual concept; it is important to define the essential goals for success in your work, life, and school. "Balance is about giving and taking a little from various aspects of your life" (p. 13).
2. "create a support system"— Consider who will be there for assistance in face the challenges, including family members, friends, class cohort members, and dissertation Chair and committee members (p. 13).

3. "be realistic"—No one can accomplish all of the work, life, and school tasks perfectly. Assess the each of the tasks and establish priorities (p. 14).
4. "make the time"—Also put yourself on the list of priorities by getting sufficient sleep and taking some time for relaxation (p. 14).
5. "find the joy"—In addition to occasionally rewarding yourself remember to "find the enjoyment in learning" (p. 14).

Identifying a research topic early in the doctoral program is another great strategy toward optimizing work-life-school balance. Beatty (2001) asserted that students who decide their dissertation topic early in the doctoral journey can create advantages for themselves. Students who have identified a potential research topic can benefit by aligning their coursework papers with that topic, thereby creating a foundation and an emergent literature review with every course assignment.

In a recent study of graduate school students El-Ghoroury, Galper, Sawaqdeh, and Bufka, (2012) sought the relationship between social support and life stress. These researchers reported that over 70% of the graduate students participating in this research reported "experiencing a personal or professional challenge that interfered with their optimal functioning" (p. 127); however, support from family members, friends, school colleagues, and work colleagues helped to mitigate the student's life stress. Identifying a dissertation topic related to the student's employment and involving the organization's management in the decision can be a very successful strategy. Collaborating with organizational leaders to design a study that might benefit the organization can help to integrate the otherwise dissonant worlds of school and work, developing a more harmonious life balance.

Online Student Advantages

The online doctorate advantage of field experience. Trossman (2010) asserted that students who are currently working in their occupational field of practice "possess knowledge, skills and work experiences" required for success in the school environment (p. 8). A study by Neumann (2005) focused on the differences between PhD programs and professional doctorates oriented toward specific professions such as those in education (EDD) and business (DBA). For returning students already working within a discipline that aligns with doctoral practitioner programs such as management, business, or education, selecting an online practitioner doctorate program can provide opportunity for both academic and professional growth.

Neumann (2005) noted that professional degree programs offer "a more reflective, practitioner-oriented mode of research education" (p. 181). Aligning with Neumann's viewpoint, the University Of Phoenix Online School Of Advanced Studies (2009) emphasized that its online doctoral practitioner programs support students in their journey "to internalize their scholarly academic learning….translating formal knowledge into personal insights integrated with their life experiences and individual beliefs" (p. 15).

Ability to contribute to organizational and leadership knowledge. Traditional students typically locate their dissertation topics and define a researchable problem based on the information provided by previous studies and by their dissertation Chair (Beatty, 2001; Lei, 2009; Mendenhall, 1983; Ormrod, 2008). Lei contended that traditional doctorate students should work closely with their dissertation Chair to select an appropriate topic and the selection process often takes over a year. Lei suggested selecting a topic recommended by the dissertation Chair because the Chair's approval of the topic is crucial; therefore, acceptance of an assigned topic can be a great time savings to the traditional student.

According to Mendenhall (1983) research on reasons that doctoral students abandon their educational goals include that the traditional dissertation topic selection process creates "needless obstacles to the doctoral candidate, the major one being boredom with the topic of the dissertation" (p. 211). Sustaining the level of interest required to motivate students to work on a research issue for several years requires a level of passion for a topic. Beatty (2001) suggested that "probably the most important criterion for a dissertation topic is that the student loves the topic. They are going to have to live with it for a long time. It will define their lives, in fact" (p. 207). While the dissertation results will be interesting and informative for the dissertation Chair, selection of the dissertation topic is a *defining decision* for the student's life and career.

Neumann (2005) also highlighted "the importance of the connection with practice through the research topic" (p. 181). Whenever possible, doctoral students, especially doctoral students in practitioner programs, should align their dissertation topic with their practice. There are several benefits in selecting a topic related to the student's profession or career ambitions. The topic selection process should be considered an opportunity to develop expertise in a specific area and to be viewed as an expert in that area once the dissertation is complete. Selection of the right dissertation topic can open doors of opportunity within the student's current organization and for student's career in the future.

An important lens when deciding on a research topic is understanding what the study might add to the body of knowledge. Beatty (2001) suggested considering "Who cares about knowing the answer to this question (or these questions)? How can the information be used once the answer is known? Is this information unique? Do the ideas make a unique contribution to theory and practice?" (p. 207).

When selecting a dissertation topic is extremely important that the topic aligns with the doctorate program. It is not sufficient just to have passion for a topic. The dissertation is the culminating event in doctoral program and the study must be germane to field of study. Specific questions for self-reflection while considering potential dissertation topics include:

- what is the focus of your doctorate program (for example, EDD, DBA, Doctorate of Management)?
- have you experienced or witnessed any organizational problems or issues that might be worthy of study?
- has the organization implemented any programs that could be analyzed for quantitative success measures or evaluated qualitatively?
- what is your vision for what you want to do 5 years from now? If there is an area that you would like to be known as "an expert", what would that area be? What research might establish that expertise?

The online advantage of technology based global access. Trossman (2010) suggested that when trying to achieve work-life-school balance returning students should "look for accredited programs that are likely to fit more easily into your schedule, such as those that offer online courses" (p. 8). Attending online programs provides the advantage of the ability to participate in class from any location with internet access. Students with families have the advantage of being able to attend class from home, and students who must travel for work have access to class from any hotel with internet. Most doctoral programs are also asynchronous, allowing participation at any time of the day or night.

Technology growth continues to facilitate the ease on online learning. A recent technology advent, cloud based storage, allows student to access their materials or papers from several devices in several locations. Some universities have developed web access to classrooms via

smart devices such as the iPad, iPhone, and Android. Results of a recent study on the perceived challenges and benefits of online (Nagel, Maniam, & Leavell, 2011) found "the student survey on their perspectives of technology use in their courses indicates several benefits - from better understanding to better communication with their instructors" (p. 141).

Receiving clear feedback. Bitchener, Basturkmen, and East (2010) contended that "written feedback on drafts of a thesis or dissertation is arguably the most important source of input on what is required or expected of thesis-writing students by the academic community" (p. 79). The face-to-face feedback typically provided in traditional universities has its advantages; however, Nagel, Maniam, and Leavell (2011) and Bitchener, Basturkmen, and East (2010) agreed that written feedback from the dissertation Chair and committee members improves communication and understanding of the required revisions. Clear comprehension of the feedback is necessary to reduce anxiety and frustration. Written feedback enables students to make necessary revisions more efficiently. Access to the Chair and committee through online forums and email is a distinct advantage over traditional methods of dialogue with dissertation committees.

Although the dissertation Chair and committee are crucial to successful completion of the degree program, it is also important that the student takes responsibility for their own learning and progress. In contrast to Lei's (2009) suggestion that traditional doctorate students would benefit from allowing their Chair to select the dissertation topic, a recent study of dissertation Chairs (Knox et al., 2011) indicated that students desire academic autonomy yet the ability to access guidance as needed. Students generally wish to have support and guidance and at the same time retain the ability to make their own decisions. The study results indicated that students preferred the ability to appropriately balance "figuring things out on their own and having someone to tell them the answers; and independence from and connection with the advisor" (Knox et al., 2011, p. 56). Chairs for online doctorate programs are typically accustomed to working with adult students who already work within their field of practice—the art of the balance is often second nature to online dissertation Chairs.

Writing Advice

Doctoral Chairs express concerns and sometimes frustrations with student writing. Kamler and Thomson (2006) noted that "frustrations over turgid prose, badly structure arguments and laboured literature reviews are common" (p. 1). There are numerous questions about how to offer effective strategies and assistance with students who vary greatly in their writing skills. It is interesting when students are asked about their approach to doctoral work and will relate that they are planning to *writing up*. Yet, the metaphor is simplistic and classifies writing as being a marginal and apparently easy activity. The phrase is misleading and fails to address the complexity associated with doctoral work. For instance, research results must be analyzed and organized into meaningful categories and themes and this requires the use of higher order thinking skills. Writing and research should be viewed as complimentary tasks that are equally important (Kamler & Thomson, 2006).

Previous graduate school experiences can sometimes create negative attitudes toward reading due to having unrealistic required reading for course work. Students sometimes view reading as a required task with little anticipation of it being a positive or even a joyful experience. Single (2010), related the need to think differently about reading for the doctoral dissertation:

Reading is a privilege. Reading allows you to have a conversation with the author at your convenience. Reading allows you to examine the thinking of some of the greatest minds in your field. What I hope is that, by employing interactive reading and note taking, you will rekindle your love of reading. p. 58

Students must take a fresh perspective on reading and learn to embrace the numerous opportunities to broaden their intellectual horizons and gain a greater appreciation for scholarly work.

Establishing a writing routine. It is important to develop a regular schedule of writing to become more fluent and productive. This starts with creating a writing plan involving short and long term goals. Unfortunately, there exists a myth that writing should depend upon personal inspiration. The reality is that effective writers have learned to consistently work and are not dependent upon their feelings. The first step is to create a schedule where there are blocks of time each day devoted solely for writing. There exists a host of potential distractions from cell phones to the desire to continually check emails. The key is to cultivate being disciplined and develop personal boundaries that foster solitude and a focused mental attitude. It is important to balance reading and writing to maintain a steady pace and systematically capture ideas from the literature (Single, 2010).

One way to become more productive while not writing is contemplating ideas about what to write next. The mental rehearsal is liberating because it allows people the freedom to be reflective about what they have been investigating. Writing should not be a chore but should be an enjoyable endeavor. Clark (2006) shared ten tips on how to encourage fluent writing:

1. *write* - being fluent means writing even when the thoughts are vague.
2. *establish a writing schedule* - develop a daily routine with a specific time to write.
3. *create rewards* - work routines need breaks. Take a walk or listen to a favorite song.
4. *develop drafts* - an excessive focus on researching can make writing seem more difficult, write drafts earlier and more often to identify what knowledge is missing.
5. *count everything* - some days the quality of writing is better than others, the weaker comments could lead to dynamic insights.
6. *revisions* - avoid rushing, take the time to rewrite drafts into exceptional work.
7. *positive self-talk* - avoid being overly critical by casting a negative thoughts about writing, see each day as a form of preparation to build upon.
8. *organize* - periodically devote serious attention to organizing research materials to make them more accessible for writing.
9. *unconditional support* - share work with a colleague or significant other who is encouraging and praises being productive in writing.
10. *capture ideas* - use a journal, notebook or Word document to record insights and creative phrases that are ingredients to writing on a regular basis.

The ten tips are creative ways to avoid writer's block and develop good writing habits. Working on the doctoral dissertation can seem like climbing a mountain due to the numerous intellectual challenges. Individuals can be more productive at the start of their degree programs by identifying practical study strategies to break down the research into manageable units. This helps avoid being paralyzed by the sometimes intimidating nature of the research process. There is a tendency accumulate numerous journal articles. Yet, having a large amount of knowledge sources that have not been read and evaluated gives the illusion of progress. It is important to balance writing, reading and research. Note-taking while reading the literature will bring greater efficiency and enjoyment to the research process. Acquiring the habit of recording ideas through notes will foster a systematic way to examine books, articles and documents. Reading can become more focused by recognizing how academic literature often has a pattern for sharing ideas. Writers will often start with a premise, outline relevant sources and data and discuss

whether the premise was adequately supported. Learning to discern the basic themes and concepts within complex narratives will is an essential critical thinking skill to write scholarly dissertations (Single, 2010).

Read a diversity of books and articles. Doctoral students should read widely and become acquainted with different writing styles. Reading offers opportunities to explore the craft of writing with a fresh appreciation and deeper understanding of how others use language to communicate knowledge. Online libraries provide access to journal articles and doctoral dissertations across the academic disciplines. ProQuest Dissertations and Theses is a comprehensive data base that contains over a million full text dissertations. Kamler and Thomson (2006) encouraged students to "...select a passage which epitomizes the quality of writing that they find difficult or admire, and then analyze it" (p. 129). Studying the passage involves asking questions about the writer's choices such as the paragraph structure (e.g. opening and closing sentences) and paraphrasing of complex ideas. Reading sections of doctoral dissertations should include an exploration of content and writing style to identify characteristics of quality narratives. Critical analysis of the texts is a wise investment of time because enables the individual to develop a writing model based on best practices.

Literature Review Advice

Morrison-Saunders, Moore and Hughes (2010) have framed the dissertation journey as an emotional roller coaster for students. Doctoral students approach the literature review with anxiety because it often represents a great unknown. During their graduate work, they have completed some major graduate term papers but the assignments were self-contained and involved a limited amount of research opportunities. The lack of research experiences creates an immediate challenge for students when facing their doctoral dissertation. Individuals will become quite descriptive in their analysis of studies because they feel overwhelmed by examining what others have written. When students are asked to create a metaphor about the difficulties of conducting a literature review they will classify it as being like "persuading (selected arms of) an octopus into a glass" (Kamler & Thomson, 2006, p. 34). Students who seek advice from books on the literature review process can become even more anxious by writer's who have a tendency to paint a picture of the review as a high stakes endeavor. Yes, the literature review is important but it needs to be framed as something that can be accomplished through diligent and thoughtful planning.

Dissertation Chairs can offer specific advice at key points in the research process. For instance, the major objectives to be accomplished in a literature review involve six tasks according to Kamler and Thomson (2006):

1. sketch out the nature of the field or fields relevant to the inquiry, possibly indicating something of their historical development and
2. identify major debates and define contentious terms, in order to
3. establish which studies, ideas and/or methods are most pertinent to the study and
4. locate gaps in the field, in order to
5. create the warrant for the study in question, and
6. identify the contributions the study will make. (p. 28)

The six tasks reveal how the review can be doable with a basic writing and reading plan. Students will need to cultivate their critical reading skills by establishing ways to make a series of judgments and choices about what studies should be examined and those to be ignored, what texts should be stressed or given less attention. This filtering of information will require

developing a good working knowledge of primary terms in the subject domain, knowing leading theories driving the field, understanding the variations in defining major concepts and arguments. The analysis will note the amount theories have been tested and the various ways the topic has been explored through research methods. Literature reviews will identify gaps or blind spots where further research is needed and note what are the areas of consensus and conflict among writers. Identifying these blind spots in the research helps transcend the narrative that merely summaries the material (Jesson & Lacey, 2006; Kamler & Thomson, 2006).

What are the characteristics of a quality literature review? It should be a scholarly review reflecting original and reflective thinking and transcend being merely a descriptive narrative (Hart, 1998). The introductory section highlights the purpose of the review and shares specific criteria and details about how the research was conducted. The introduction should describe the use of electronic and print resources: textbooks, journal articles, research reports, Google searches, online libraries and manual searches within libraries (Jesson & Lacey, 2006). Criteria should be shared to indicate some of the basic boundaries established for the literature search and selection of sources (Stake, 2010). Distance education students should be reminded to utilize the university libraries near their homes because they represent valuable information resources.

Use mind maps to organize and present information. Doctoral students should consider creative ways to use mind and concept maps for both informal and formal planning and organizing literature reviews. Students can use mind maps in their dissertations to create a visual picture of their primary literature sources (Muirhead, 2010). A map can be useful device to highlight the diversity of knowledge resources used such as libraries, Internet databases, journals, magazines, blogs, newspapers and research documents. Concept maps and be used to summarize key points of an article or chapter. Graphic organizers effectively share relationships and distinctions involving complex ideas. Mind maps can present information in ways that engage people and encourage reflective thinking. Software to create mind maps offer an assortment of sophisticated tools such as Mind Manager and iPad apps (e.g. Simple Mind and Mind Meister).

Share reflective and clear narratives. Excessive use of quotations is a common problem among novice researchers. Quotations should used for specific purposes such as insights into significant ideas or concepts. A well-organized review will show a logical progression of studies by tracing major trends with a combination of historical and current literature. Historical studies supply important contextual and background information. Research theories should be compared and contrasted with an analysis of the different perspectives on arguments favoring or opposing particular points of view. This approach strengthens the review by demonstrating objectivity about the complexity of the research issues and the need for more investigation. Students need to be patient because it will take time and a series of revisions to construct rough drafts and refine their review. The goal is to produce a well-organized narrative that is clearly connected to the primary research question.

Conclusion

Obtaining a doctorate can be a long and arduous process. Having enough time to successfully meet life's demands while developing as a scholar will always be a concern for nontraditional students, but these guidelines are designed to make the journey a little less daunting. Technological advances allow students to attend online classes from nearly any location and at any time. Dissertation development requires writing skills and the ability to conduct a well-organized literature review, but technology can also facilitate writing, mind mapping, and communication to simplify this task. A strategically planned dissertation topic can be used to address existing organizational issues, transition scholarship into practice, and enhance career opportunities.

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Editor's Note: Student feedback plays a valuable role in course improvement. In brick-and-mortar classrooms, near complete data can be obtained under controlled conditions in the final class or exam. If taken outside the classroom, the response rate falls off. This paper suggests ways to encourage a greater response.

Top 20 Strategies to Increase the Online Response Rates of Student Rating Scales

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Abstract

Over the past decade, a conversion from paper-and-pencil to online administration of student rating scales has been taking place at hundreds of institutions world-wide. Probably the most serious problem that has emerged is low response rates compared to the previous in-class administrations. Faculty and administrators have addressed this problem by experimenting with several techniques to increase rates, including a variety of incentives and disincentives for students to complete the forms. This online issue began with face-to-face (F2F) courses, but now is occurring with online and blended/hybrid courses as well. This article is a state-of-the-art review of this problem. The proposed techniques and all of the related issues will be examined in the context of the accumulated research and current practices. This review will culminate in a "Top 20" list of the most promising strategies along with suggestions for assuring high response rates from year to year.

Keywords: student evaluation of teaching (SET), online administration, teaching effectiveness, face-to-face courses, blended courses, hybrid courses, Web-based courses, distance learning

Introduction

The research on student rating scales has been accumulating for 90 years (Freyd, 1923). Over the past decade, a conversion from paper-and-pencil to online administration of these scales has been taking place at hundreds of institutions world-wide. This trend began predominantly with face-to-face (F2F) courses, but has slowly spread to the evaluation of online and blended/hybrid courses.

This online administration has been executed either by an in-house IT system or by an outside vendor specializing in online administration, analysis, and score reporting, such as CollegeNET (*What Do You Think?*), ConnectEDU (*courseval*), and IOTA Solutions (*MyClassEvaluation*). Even the choice of the course management system was crucial in providing the anonymity for students to respond, which could boost response rates (Oliver & Sautter, 2005). All commercially-developed scale packages also provide online administration, along with the scale and other delivery services. Those scales include *Student Instructional Report II (SIR II), Course/Instructor Evaluation Questionnaire (CIEQ), IDEA Student Ratings of Instruction,* and *Student Evaluation of Educational Quality (SEEQ)* (Berk, 2006).

The problem is that response rates have been consistently lower than their paper-and-pencil predecessor, where the instructor controlled the in-class response rate with a student administrator and collector. In some cases, these rates for F2F courses have been 50% and even as low as 30%, which are useless for any decision making. Faculty members at various institutions have used that excuse to resist the online conversion. Experience with the online administration process has yielded a variety of strategies to increase response rates, including incentives and disincentives for students to complete the forms, which have now crept back up to the 70s and above at some institutions.

This article examines the state-of-the-art of response rates. Given its importance in considering online administration of scales and its impact on the interpretation of results, administrators and faculty have experimented with a wide range of techniques to increase rates. These techniques and all of the related issues will be reviewed in the context of the accumulated research and current practices. This review will culminate in a "Top 20" list of the most promising strategies along with suggestions for assuring high response rates from year to year.

Low Response Rates

What's the Problem?

The problem with low response rates is that they provide an inadequate data base from which to infer teaching effectiveness from the scores on a student rating scale as well as other measures. If the percentage of responses is too small, representativeness of student responses can be biased. This significantly diminishes the usefulness of the ratings. Although the minimum response rate based on sampling error for a seminar with 10 students may be different from a class with 50, 100, or larger (Nulty, 2008), rates in the 80–100% range will be adequate for any class.

The response rate for online administration has been reported in the 50s compared to 70s–80s for paper-based administration (Benton, Webster, Gross, & Pallett, 2010). The online rates have been consistently lower than paper at several institutions (Anderson, Cain, & Bird, 2005; Avery, Bryan, Mathios, Kang, & Bell, 2006; Morrison, 2011; Nowell, Gale, & Handley, 2010; Nulty, 2008; Sid Nair, Adams, & Mertova, 2008; Stowell, Addison, & Smith, 2012). This is a frequent objection to online ratings reported in faculty surveys (Crews & Curtis, 2011). Fear of low response rates has been a major deterrents why some institutions to adopteonline systems.

What's the Reason?

Research on this topic indicates possible reasons students don't respond: apathy, technical problems, perceived lack of anonymity, lack of importance, inconvenience, inaccessibility, and time for completion (Avery et al., 2006; Ballantyne, 2002, 2003; Dommeyer, Baum, & Hanna, 2002; Sorenson & Reiner, 2003). Recent improvements in the design and execution of online delivery systems have at least reduced and, in some cases, eliminated most of those perceptions.

Faculty members also have had concerns that dissatisfied students are more likely to respond than other students (Johnson, 2003). This possible negative response bias was not supported by Kherfi (2011) and Benton et al.'s (2010) study that found low correlations between response rate and student ratings.

Top 20 Strategies to Boost Response Rates

Administrators, faculty, and students at several institutions have tested a variety of strategies to increase response rate (Bennett & Sid Nair, 2010). Researchers have examined the use of incentives and disincentives. They all contribute to raising rates to varying degrees. Here is a collection of 20 of the most effective (Adams, 2012; Berk, 2006; Dommeyer, Baum, Hanna, & Chapman, 2004; Johnson, 2003; Sorenson & Reiner, 2003; The IDEA Center, 2008). They are grouped according to the person responsible for executing the strategy—the coordinator or director of the online system and faculty and administrators.

Coordinator/Director of Online System

1. Institution/department/external vendor coordination and management of online system must be independent of faculty to monitor the entire process (Berk, 2006)
2. Specifies purpose(s) of ratings (teaching improvement, salary, promotion, tenure) in the scale's directions (Benton & Cashin, 2012; Berk, 2006), despite the minimal effects on ratings (Centra, 1976; Marsh, 2007)

3. Assures ease of computer access and navigation on campus (Sorenson & Reiner, 2003)
4. Monitors use of technology (PCs/Macs, iPads, etc.) and procedures for in-class administration (The IDEA Center, 2008)
5. Assures anonymity and confidentiality (Adams, 2012; Berk, 2006; Sorenson & Reiner, 2003; The IDEA Center, 2008)
6. Provides instructions on how to use the system (Dommeyer et al., 2004; Johnson, 2003; Norris & Conn, 2005)
7. Maintains a convenient, user-friendly system (Layne, DeCristoforo, & McGinty, 1999; Ravelli, 2000; Sid Nair & Adams, 2009; Sorenson & Reiner, 2003)
8. Sends reminders to all students before window of response opens, then frequent reminders during window to only students who have not responded (Adams, 2012; Cook, Heath, & Thompson, 2000; Dommeyer et al., 2004; Sid Nair et al., 2008)
9. Plans ad campaigns to inform students of process online and in student publications (The IDEA Center, 2008)
10. Provides school-wide incentives, such as a lottery for an iPad, iPhone, or some other iGadget, bookstore items, or food coupons (Ballantyne, 2003; Johnson, 2003)
11. Acknowledges and rewards faculty and/or departments that meet target response rate (The IDEA Center, 2008) (*NOTE:* Make sure this "healthy competition" doesn't affect the integrity of the process.)
12. Promotes donor/alumni contributions of a dollar amount to a charity for every form completed (Ravenscroft & Enyeart, 2009)
13. Communicates the notion that assessment of teaching and the students' formal feedback in that process are part of the campus culture and their responsibility (The IDEA Center, 2008)
14. Permits students' early access to final course grades ASAP after course (Anderson, Brown, & Spaeth, 2006; Berk, 2006; Dommeyer et al., 2004; Johnson, 2003)

Faculty and Administrators

15. Deans, department chairs, and faculty communicate to students the importance of their input (Berk, 2006; Johnson, 2003; Sorenson & Reiner, 2003)
16. Faculty emphasize the intended purpose(s) of the ratings (The IDEA Center, 2008)
17. Faculty strongly encourage students and remind students to complete forms (Adams, 2012; The IDEA Center, 2008)
18. Faculty "assign" students to complete forms as part of course grade (Ravenscroft & Enyeart, 2009)
19. Faculty provide positive incentives, such as extra credit or points or dropping a low grade on an assignment or quiz (Dommeyer et al., 2004; Johnson, 2003; Prunty, 2011)
20. Faculty set an in-class time to simulate the "captive audience" concept of the paper-and-pencil administration, but this time with laptops, iPads, or iPhones to complete forms; also computer lab or chat-room times can be reserved for this purpose (The IDEA Center, 2008)

Recommendations

As you peruse the preceding list, there will be several strategies that will strike your fancy and fit into your online system and others that may incite you to riot because they may be perceived as unethical ("assign" students or dropping a low grade) or even illegal (early access to grades). Which ones should you pick?

Combinations of Strategies

Reports by the researchers and administrators who have tested these various strategies indicate:

a. 1–8 Administrative and organizational procedures are essential.
b. 9–13 Incentives are variable in terms of increased response rate.
c. 14 Early posting of grades has produced the highest increase of any single strategy.
d. 15–17 Administrative procedures are highly recommended.
e. 18–19 Incentives are the most contentious.
f. 20 Administration options can produce response rates comparable to paper-based version.

Pick the "Right" Combination

Overall, it is the right combination of administrative procedures and incentives that can yield response rates in the 70s–90s. The administrator of the online system and faculty must decide on the best combination that will receive the commitment of all stakeholders involved in the process and be compatible with the campus culture. The system must then be executed properly to assure a high rate of student return on the online investment.

Future Response Rates

Once the system is implemented, the students will remember their "rating experience." This applies to all courses—F2F, online, and blended/hybrid. If it was positive and meaningful, then they'll probably participate the next semester; if it was negative due to administrative or technical glitches or too time-consuming, expect response rates to noise-dive. The design and operation of the online administration will be a key determinant of whether students will continue to complete the forms.

Students' expectations about how the results will be used are also critical to future response rates. Chen and Hoshower (2003) found that students' motivation to participate in the assessment system hinges on the following observable outcomes (in order of decreasing importance): (1) improvements in teaching, (2) improvements in course content and format, and (3) faculty personnel decisions (promotion, tenure, salary increase).

Closing the Loop

The efforts to make changes and the actual changes that occur based on the results are often referred to as "closing the loop" (Bennett & Sid Nair, 2010). It builds credibility and administrative accountability into the system. The changes convey: "Student ratings are meaningful and important." Their input or feedback really matters. Students are engaged as active participants in the process of assessing teaching effectiveness.

Students' eyeballs will be riveted on the follow-up actions taken by administrators and faculty. Their texting grapevine is extremely effective. Contrary to the preceding scenario, suppose students do not see any results. Why should they bother to complete the forms the next time they're asked? Their expectations are explicit. The intended purposes of the ratings were stated in the directions on the scale. If those purposes are not fulfilled, the response rates can plummet. The students' role is an essential antecedent to the success of the system. All of these elements are interconnected and must work together effectively to assure seamless execution of the online system and high response rates from year to year.

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Editor's Note: When you change the frame, does it change the picture? This research compares student evaluations of traditional and online classes and finds one significant difference. It would be valuable to replicate this research with other classes to determine how widely these findings might occur.

Online versus Paper Student Evaluations of Teachers: Analysis of Comments

John C. Briggs and Stuart HUSA

Abstract

A large public university in the west traditionally used paper (PE) to conduct its student assessment of teacher effectiveness. One semester this university conducted a pilot project of "online" evaluation (OE) of teaching effectiveness. In both paper evaluations and online evaluations, students are given the opportunity to provide written evaluations of their instructor's strengths, weaknesses, and other helpful comments. To examine the differences between delivery modes, courses were matched by instructor and class between the online evaluations and their paper evaluations counterparts. It was found that students were more likely to give written comments using PE. However, students using OE gave longer, thoughtful responses and were more likely to suggest improvements to courses. This has strong policy implications to administrators deciding to make the transition from paper evaluations of faculty to online.

Keywords: Course evaluation, teacher evaluation, online evaluation, paper evaluations, qualitative evaluation, student comments, written comments, evaluation word count, summative course design, reflective thinking

Introduction

During the past decade an important change in gauging student opinion of teacher effectiveness is the switch from paper evaluations (PE) to online evaluations (OE) (Lovric, 2006). The switch has been driven by the advantages of OE implementation, among which are lower costs (Anderson, Cain, and Bird, 2005; Lovric, 2006; Nowell, Gail, and Handley, 2010), less class time set aside to complete evaluations (Liu, 2006), and ease of use (Avery, Bryant, Mathios, Kang, and Bell, 2006; Ha, Mars, and Jones, 1998; Layne, DeCristoforo, and McGinty, 1999).

From a student perspective, OEs provide them with more choices when completing a teacher evaluation. A student can complete the evaluation at a time and place of their choosing (Donovan, Mader, and Shinsky, 2006; Venette, Sellnow, and McIntyre, 2010). However, students are concerned whether OE is truly anonymous (Dommeyer, Baum, and Hanna, 2002).

Another advantage of OE is better flexibility in student answers to open-ended questions (Gamliel & Davidovitz, 2005). This is important because faculty do use student evaluation of instruction to improve their teaching technique (Jackson, Jones, and Rodriauez, 2010). The comments can provide both summative information, which tells how well the course is taught as well as formative information, which provides analytical information to improve teaching methods (Haladyna & Amrien-Beardsley, 2009, Kowai-Bell, Guadagno, Little, Preiss, and Hensley, 2011).

A recent study by Morrison (2011) found that students using OE gave more detailed comments. However, the number or favorability level of comments was the same for OE and PE. A study by Liu (2006) found similar results. Liu's study found that OE comments were more likely to be detailed and provided the instructor with constructive feedback for improving future teaching. Heath, Lawyer, and Rasmussen (2007) observed students who use OE are more likely to provide qualitative feedback. In addition, their comments were 50% longer than those completing a PE. Another study found that OE students gave more specific recommendations for future

improvements to the course than OE students (Lovric, 2006). Such comments were made because the students felt freer to respond in the OE than the PE mode.

Not only do teachers feel that the OE mode provides greater feedback from the students, the student also notice the difference. Indeed, in a study by Anderson et al. (2005), students felt that OE provided them the opportunity to offer more effective and constructive feedback.

However, these studies analyzing qualitative feedback were very limited in scope. Table 1 shows the studies that measured qualitative feedback and the number of students in each study. In addition, Table 1 includes the number of courses covered in each study.

Table 1
Studies in Qualitative Feedback: Number of Students and Courses

Study	Number of Students	Number of Courses
Anderson, Cain, and Bird (2005)	Unknown	9
Donovan, Mader, and Shinsky (2006)	413	11
Heath, Lawyer, and Rasmussen (2007)	342	3
Laubsch (2006)	486	Unknown
Liu (2006)	43	2
Lovric (2006)	470	1
Morrison (2011)	499	1

As shown in Table 1, the number maximum number of courses used in any one study is nine. Also, the maximum number of students is less than five hundred. These numbers are quite low. Thus a more comprehensive study is needed with a broader range of courses or sections, and a larger number of students completing evaluations. Current research does not provide the numbers that would be seen at a small college, much less a large, comprehensive university. Educational institutions considering a switch from PE to OE are still unsure if an advantage of OE is an increase in the qualitative feedback from their students. A large study would confirm whether differences exist in qualitative feedback captured by OE vs. by PE.

Method

The purpose of this study was to examine whether or not there were broad scale significant differences in student qualitative responses between online and paper course evaluations. A large public university in the west conducted a pilot project for online course evaluation. In order to minimize variables, PE evaluations were done the following spring semester using the same faculty in the same classes in the same university. By focusing on just the evaluation mode, the comparison offers clearer qualitative distinctions. If a course taught by the same faculty had multiple sections in either semester, all of those sections were included. All OEs that did not have PE counterparts, or had two or fewer responses (per section) were excluded from the analysis.

Both OE and PE surveys had three identical qualitative questions: 1) “Discuss the strengths of this instructor’s teaching” (Strengths), 2) “Discuss the weaknesses and/or area in need of improvement for this instructor’s teaching” (Weaknesses), and 3) “Please provide any other

comments you feel would be helpful to the instructor regarding his/her teaching performance/ability" (Other Comments).

A word count was conducted for each question in each type of survey. For OE, the word count option on Microsoft Word was used to count the number of words in each comment. For PE, words counts were done by hand.

Results

This comparison included seventy-seven matched classes between the Spring 2009 OE and the corresponding classes evaluated by PE during the Spring 2010 semester. The number of 2010 students who submitted PE was 1,243. The number of 2009 students who submitted OE was 868. The total number of students in this study was 2,111.

Table 2
Present Study: Number of Students and Number of Courses

	Number of Students	Number of Courses (Sections)
Paper (PE)	1,243	71
Online (OE)	868	82
Total	2,111	153

The word count range for the three questions ("strengths", "weaknesses", and "other comments") had a minimum of 0 words for both OE and PE. The maximum numbers of words used was higher for OE than for PE in all three questions. For instance, in "strengths" OE had a maximum word count of 132 which was 55% above the PE maximum count. The other two questions had similar results: OE maximum word count for "weaknesses" 276% above PE and OE maximum word count for "other comments" 69% above PE.

Table 3
Word Count: Minimum, Maximum, and Range

	Strengths			Weaknesses			Other Comments		
	Min	Max	Range	Min	Max	Range	Min	Max	Range
Online (OE)	0	132	132	0	320	320	0	125	125
Paper (PE)	0	85	85	0	85	85	0	74	74

Response rates for PE were much greater than for OE (Table 4). Nearly all (95%) of the PE evaluations had some type of response to the "strengths" question. OE evaluations had a 70% response rate. In the "weaknesses" question 53% of the PE evaluation had a response versus 44% of the OE evaluations. In the "other comments" PE response rates were slightly higher than OE response rates.

Table 4

Responses Rate per Question

	Strengths	Weaknesses	Other Comments
Online (OE)	70%	44%	34%
Paper (PE)	95%	53%	30%
Total	85%	49%	32%

There were significant differences ($p < .0001$) in the word counts between OE and PE. For OE responses, there were significantly greater numbers of words than for the PE responses on all three questions and on the composite total (see Table 5). This supports the Heath et al. (2007) study. On the "strengths" question, there were significantly more words in the comments for the OE than the PE, t= -10.25, p<.0001. There were also significantly more words on the OE than the PE for the "weaknesses" question, t= -7.78, p<.0001. Furthermore, there were significantly more words for the OE than the PE for the "other comments" question, t= -8.28, p<.0001. Listed in Table 4, more comments on all three questions were included in the PE than OE: 1,177 (PE-"strengths") > 610 (OE-"strengths"); 653(PE-"weaknesses") > 378 (OE-"weaknesses"); and 369 (PE-"other comments") > 298 (OE-"other comments").

Table 5

Paper vs. Online: Number of Observations (N), Means, and Standard Deviations (SD)

	Paper (PE)			Online (OE)			
	N	Mean	SD	N	Mean	SD	t-test
Strengths	1,177	14.86	10.71	610	21.94	18.43	-10.25[1]
Weaknesses	653	14.25	12.65	378	25.22	32.02	-7.78[1]
Other	369	13.61	12.53	298	24.51	21.11	-8.28[1]
Total	1,243	25.60	20.17	868	34.82	34.15	-7.77[1]

[1] $p < .0001$

When courses were analyzed by course level, significantly longer comments were given in the OE than the PE in both lower and upper division courses (see Table 6 and Table 7). In lower division courses, significantly longer comments were provided on the OE in the "strengths" question, t= -6.91, p<.0001, in the "weaknesses" area, t= -5.76, p<.0001, and in the "other comments" area, t= -5.66, p<.0001. Again, the actual number of written responses was greater on all three questions for the PE: 365 (PE-"strengths") > 221 (OE-"strengths"), 194 (PE-"weaknesses") > 147 (OE-"weaknesses"), and 106 (PE-"other comments") > 99 (OE-"other comments"). For upper division courses, there were significantly longer comments on the OE on all three questions. For the "strengths" question, there were more words for OE vs. PE, t= -8.92, p<.0001, on the "weaknesses question", t= -5.97, p<.0001, and on the "other comments" section, t= -6.44, p<.0001. Table 5 lists more written comments on all three questions on the PE. There were 724 (PE-"strengths") > 334 (OE-"strengths"), 413 (PE-"weaknesses") > 205 (OE-"weaknesses"), and 240 (PE-"other comments") > 180 (OE-"other comments").

Table 6

Paper vs. Online, Lower Division: Number of Observations (N) , Means, and Standard Deviations (SD)

	Paper (PE)			Online (OE)			
	N	Mean	SD	N	Mean	SD	t-test
Strengths	365	12.67	8.78	221	19.58	15.41	-6.91[1]
Weaknesses	194	10.81	9.49	147	21.37	23.11	-5.76[1]
Other	106	9.65	8.73	99	21.80	20.18	-5.66[1]
Total	384	20.17	14.27	299	32.20	27.18	-7.45[1]

[1] $p < .0001$

Table 7

Paper vs. Online, Upper Division: Number of Observations (N) , Means, and Standard Deviations (SD)

	Paper (PE)			Online (OE)			
	N	Mean	SD	N	Mean	SD	t-test
Strengths	724	16.03	11.12	334	24.66	20.23	-8.92[1]
Weaknesses	413	16.02	13.44	205	28.08	36.38	-5.97[1]
Other	240	15.35	13.76	180	26.64	22.01	-6.44[1]
Total	762	28.75	22.07	457	41.11	37.93	-7.19[1]

[1] $p < .0001$

Discussion

The results of the present study indicate increased verbosity in OE than in PE. These findings validate the results of previous studies (Heath et al., 2007; Liu, 2006; Lovric, 2006, Donovan et al., 2006; Laubsch, 2006). Another finding was that there were actually more written comments for classes evaluated by PE than OE which is dissimilar to the same previous studies. Although students are more likely to comment about an instructor's teaching ability or about the class on PE, a student who types a comment on OE are more likely to provide a longer and more thoughtful remark about the class or instructor.

OE written comments have more words and detail than for PE, which could be caused by various factors. For OE, students have more time to think and thus can write a more thoughtful response than for PE in the classroom. Students can take as much time as they wish to complete the evaluations on their own computer. PEs are usually done at the end of class, usually in the last ten or fifteen minutes of class time. Because of this duress, students do not have enough time to provide purposeful observations about their teacher's ability.

Additionally, OE students can choose times that they are most comfortable to complete the evaluation. OE students can complete their evaluations in an environment free from the stress of

time limitations. PE students, on the other hand, might be thinking of the next class they have to walk to, whether they are going to have enough time for lunch, or if they will be able to catch the bus or train back home.

Furthermore, for PE, there is a space limit on the evaluation page. Each PE qualitative comment takes up about a third of a page. Some students may look at this space and feel that their responses are limited to the size of the space provided. Also, if they write using large characters they may not have enough space to put down more than a few words. OE qualitative entries at San Jose State University have a 2,000 character limit. This limit allows OE students to write long and thought-provoking comments.

Finally, today's students are much more comfortable using a keyboard than using a pen or pencil. Today's student is used to writing and entering data using a computer and other electronic devices, writing using a pen and pencil is unfamiliar and slow to these students. This level of comfort means that OE students can concentrate on giving useful comments, rather than concentrate on producing legible responses. If their hands are not used to writing, they fatigue more easily and become discouraged from writing longer comments.

There were more written comments for classes using PE than OE. This finding differs from previous studies (Heath et al., 2007; Liu, 2006; Lovric, 2006, Donovan et al., 2006; Laubsch, 2006). There are various possible reasons for this. In the present study, our courses are matched with courses from one year later instead of the same semester. Since the classes are matched with courses from a different semester, the results could be influenced by outside factors, such as the economic recession or increased student fees and tuition, etc.

Another reason for the greater number of comments in PE than OE could be the actual presentation of the online teaching evaluation. In our teaching evaluation, the student must click the "Next" button. Some students completing the OE may be in a rush or be distracted and just click the "Submit" button without completing the written comments. This could be the case, because in Table 2, 70% of the students complete the first written "strengths" while only 44% complete the second "weaknesses" question. The completion rate of the third "other comments" question is even lower at a 34% completion rate.

A final factor could be that OE are new at this university, and OE response rates tend to increase over time as students become more familiar with completing teaching evaluations online. Lastly, it is possible that many students were planning to complete the written comments after filling out the 13 multiple choice evaluation questions, and they just missed the deadline to complete the evaluation.

Another interesting note is that OE comments about the instructor's weaknesses or need for improvement were on average longer than the comments in the teacher's "strengths" area. For OE, the range of 320 words for "weaknesses" was larger than the 132-word range for the OE "strengths" area. For the PE, the range for both the "strengths" and weakness areas was consistent at an 85-word count. When filling out OE surveys, students may have more time to focus on the negative aspects of an instructor and their teaching methods. This does not seem to be the case with PE, because the comments tend to be shorter, and the average word count was 14.86 (strengths) to 14.25 (weaknesses) for the PE.

This is not to say that more negative comments are a bad thing. No one is perfect, even college instructors. The only way a teacher can improve their instruction is by knowing what works and what does not work. Having students comment on the portions of instruction that work poorly enables a teacher to identify those things that need to be changed. Once this is identified, an instructor can try various other methods that might be more effective.

When the courses were broken down by course level (upper and lower division), there were: 1) more written comments in the upper division courses and, 2) longer comments in the upper division courses. These results could be due to having older and more experienced students in these courses. Furthermore, this could indicate better communication skills among upper classmen. Perhaps juniors and seniors may be used to writing longer essays and papers in their courses, and this could lead to more and longer written comments for both OE and PE. Also, upper classmen have experienced more professors, so have more teaching techniques and approaches to draw from than underclassmen.

From another perspective, maybe upperclassmen are more familiar with the evaluation process. Underclassmen may be uncomfortable giving comments because they have been taught in high school not to criticize their teachers. As a student progresses through a college or university he or she learns that constructive criticism is tolerated by the faculty as part of the development of critical thinking skills. So, the expectation of not criticizing your instructor lessens through time and age.

Also, underclassmen may not be convinced that the evaluation process is anonymous and might fear retribution from their instructors. After the underclassmen go through several semesters of writing teacher evaluations they learn that retribution by faculty is infrequent. Also, they begin to realize that if they are not going to take another class from that faculty member, the likelihood that a faculty member will punish them for their comments is remote.

Conclusion

This study was larger and much more comprehensive than previous studies. Because of its size, educational institutions can use these findings to make better decision concerning PE versus OE. This study found that one of the advantages of OEs is better qualitative responses. Indeed, the results of the present study indicate that the written comments have more words and are longer for OE than for PE. However, PE students tend to give more qualitative responses than OE, albeit shorter. Finally, OE students are more likely respond when asked about what could be improved in a course or with a teacher.

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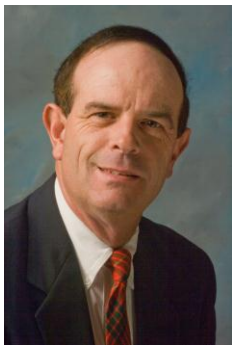

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Editor's Note: For those of us who long ago adopted a specific instructional design model, this offers a new challenge – rethink the design in terns of uour specific needs, goals, content, students, evaluation, and communication media.

A New Instructional Design Model for Online Instruction: GRAPE

Firat Sarsar
Turkey

Abstract

The managerial complexity of instructional design affects students' success, teachers' motivation and also instructional designers' standing. This paper offers a different perspective on ways to facilitate instructional design by introducing the GRAPE concept. GRAPE is a new instructional design model designed specifically for online learning environments bringing together a variety of related concepts. The different components of GRAPE such as creating process, using tips, cons and pros are explained in this paper. GRAPE is a new model, so it should be improved, experienced and continuously develop by teachers, instructional designers and students.

Key Words: GRAPE, Instructional Design, Online Learning

Introduction

Instructional Design (ID) is a process of creating efficient, effective and relevant teaching. Branch and Merrill (2012, pg.8) define ID as "a system of procedures for developing education and training curricula in a consistent and reliable fashion". Reigeluth (1999) sees it as a set of efficient and understandable directions provided to help people learn and develop. In other words, ID is a systematic process of applying instructional strategies, theories and relevant approaches in order to facilitate, manage, and monitor teaching/learning activities.

Gustafson and Tillman (1991, pg 4) state that "applying the principles of ID can increase effectiveness, efficiency, and relevance of the instruction". ADDIE is one of the most popular approaches that provides a solid base for the instructional process and facilitates education through application of instructional design principles. ADDIE is an acronym of (A)nalyze, (D)esign, (D)evelop, (I)mplement, and (E)valuate. (Dick, Carey & Carey, 2005) ADDIE is not a learning theory; it is rather an "illustration of the conceptual components of many instructional design/development models" (Brown & Green, 2011, pg. 7). While ADDIE may not stand out as an independent model, it can be seen as "a paradigm that refers to a family of models that share common underlying structure" (Branch and Merrill, 2012, pg.9).

ADDIE covers essential steps/components for almost all instructional design models in various fields of education. For instance, in general terms it can be a part of blended learning environments (Hibley, Amaral, Shank, & Shibley, 2011), a part of online learnings (Wang & Hsu, 2009; Neal, 2011) or a part of multimedia assisted learnings (Kuo, 2012; Jin-Hua, Chun, Hui, & Shumei, 2009).

Online learning environment is one of the popular environments in education, because of the recent technological advances, freedom to learn (time and location base) and accessibility. Generally, teachers acquire experience through trial and error. Sometimes this process becomes time consuming and expensive.

There are many ID models that have been applied in online learning environments, but there are only a few ID models that have been created with online learning environments in mind (ASSIST-ME model, Three-Phase Design Model (3PD)).

It is really difficult to say which model works best in online learning environment, because each model has its own pros and cons. Another reason for this ambiguity is the fact that learning depends on many variables such as conditions of learning (Gagne, 1985), the role of culture (Vygotsky, 1978), environment and personal factors (Bandura, 1989) and motivational strategies (Keller, 1979). An efficient model should cover all of these variables to make instruction a success.

Personal Instructional Design (PID): Combining Theory and Practice into Action

Instructional designers use the models which have been proven to work efficiently such as ADDIE, Dick & Carey, Hulls and so on. However there is always an option to use your own instructional design model that would be customized to your specific context. As Gagne and his colleagues (2005) remind us, there is no only one and perfect instructional design model. Creating your own PID model will not only help you to manage your teaching process efficiently but also predict your own pros and cons.

Since 2005, I have taken classes on instructional design, and I have taught online, face-to-face and blended courses in higher education. Things I have learned through teaching helped me to better understand ways of facilitating learning, managing instruction, evaluating outcomes and also process. Throughout the years I had to use a variety of instructional design models that lead me to realize that most of the models I have used were suitable for my face-to-face and blended (hybrid) courses. In other words, my experience with instructional models has taught me that most of the concepts can be efficiently applied to any type of instruction that sees computer as a tool only. I came to a realization that something is missing my instruction process, things that I attempt to describe next.

Instructional Design for Online Learning: The major instructional design models were created with face-to-face learning in mind and then later used or reconfigured for online learning. The PID is created for online learning environment but using its own terminology and relying on its own facilities. The rapid changes in educational theory caused by online learning encouraged me to create PID model. Online learning dynamics are significantly different from face-to-face learning dynamics, so there is no doubt that an instructional design model for online learning environment needs to be created.

Analyzing Issues: My personal strategy of instructional design process is to intensify analyze part of process. As far as I have experienced, analyze part is the one of the most important stage of process and it is also beginning stage of the design process. Analyzing part of instructional design should be strong and well-designed, because it affects quality and efficiency of whole the process.

Personal Instructional Design Model: GRAPE

The PID was created to meet the demand of not only online teachers and students but also designers. GRAPE is the process of (G)athering,(R)egistering, (A)nalyzing,(P)rogramming and (E)valuating.

As Figure 1 shows my model is based on a linear design. Gather step requires gathering as much as data is possible. Register asks to categorize data by subtitles such as students, teachers, and designers. Analyze expects a detailed analysis of data by using categorized subtitles. Program goes on to designing, developing and implementing the instruction. Evaluate provides assessment of the success of teachers, students and designers. Each step implies feedback that enables stakeholders to see pitfalls and things to be improved as well as providing information for the next steps. The unique part of this PID is that it gives place for fixing and awarding. It is accomplished by gathering feedback(s), when the reflections of teachers and experiences of

designers will be the data of the fixing part once there is a need to fix or improve instruction. Awarding is to give the credit to the stakeholders. All the steps of the design will be detailed by using real life examples.

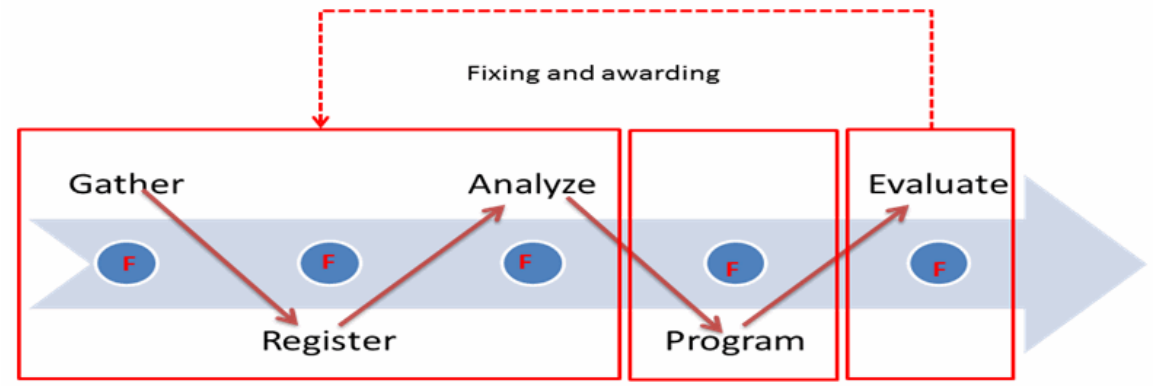

Figure 1. Grape Model

As it was mentioned before, GRAPE is designed based on teaching experiences. ADDIE is one of the main templates used in my teaching experience, so this PID is also compatible with ADDIE design. As you see Figure 2, Gather, Register and Analyze steps of PID cover Analysis part of ADDIE; Program step of PID covers design, development and implementation parts of ADDIE; Evaluate step of PID is similar to evaluation part of ADDIE design.

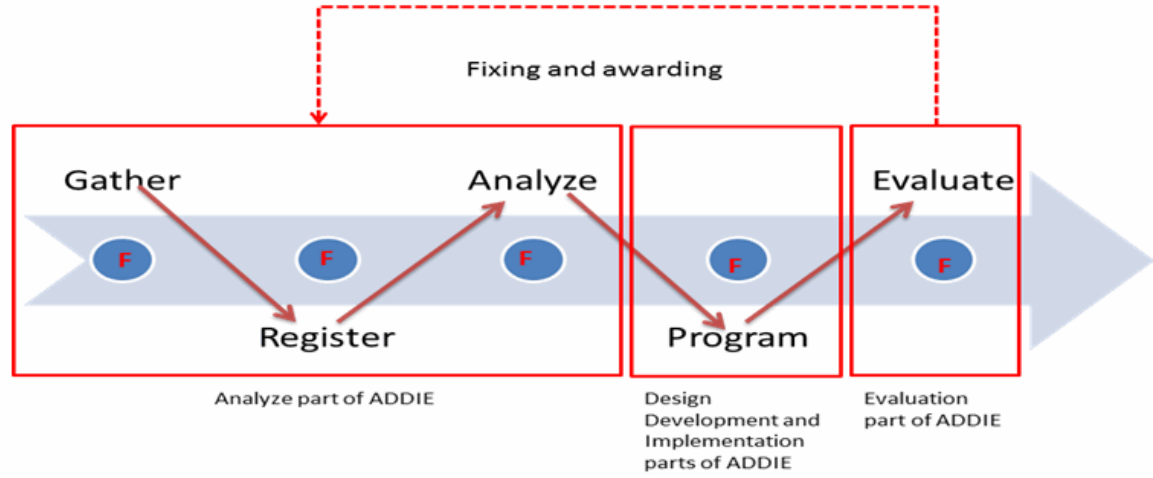

Figure 2. Grape vs. ADDIE

Gather

During this step, instructional designers are expected to collect as much data as it is possible. Instructional designers can gather data by using surveys, open-ended questions, teachers' and instructional designers' own experiences, and examples from the other designs.

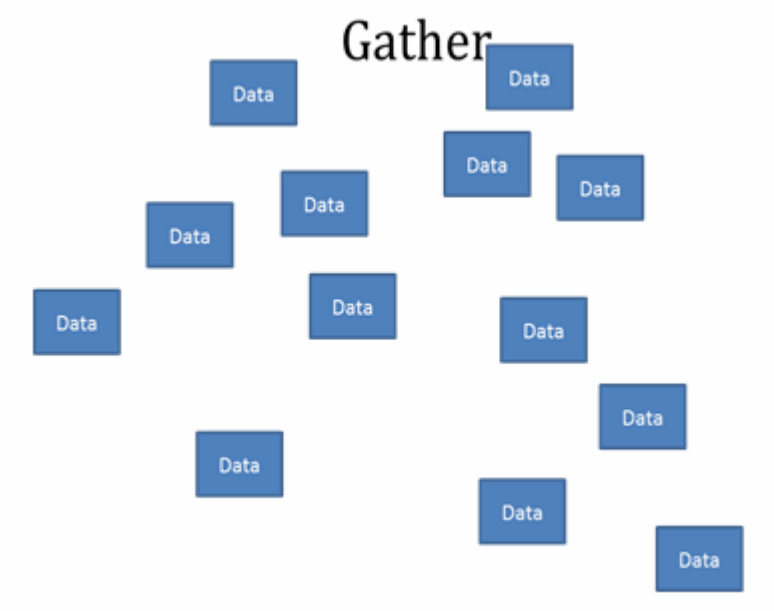

Figure 3. Gather Phase

As figure 3 shows, data can be found everywhere in various forms, so gartering as much data as possible helps designers to create learning environments. It also has a beneficial effect on efforts of teachers to develop the instruction.

In this paper terms teacher and instruction designer are used interchangeably, as teachers often end up designing the instruction process ; however it is not an ideal or expected phenomenon. Teachers are responsible for managing the instruction as it is quite an intensive work. The ideal process for teacher is to work/collaborate with an instructional designer to facilitate process, because online learning environments have their own dynamics that differ from those of face to face learning environments. It can be expected that teacher can handle the instruction, but design. Designing of the instruction needs more expertise for processing it.

Register

Gather step assumes that a large quantity of data will be collected; later this collection of data should be organized. Register phase gives instructions on how to systematically organize data. As you see in Figure 5, data were classified according to three denominators such as student, instructor and environment. This classification is helpful for instructional designers, because an IT designer should control student part, instructor part and also environmental part of the process.

Student Part includes students' characteristics, their needs, backgrounds, skills, abilities, etc; instructor parts includes teachers' background, experiences, technological skills, pedagogical knowledge, content knowledge, etc; environmental part includes learning environment design, visual design, motivational design; adequacy of learning process, etc. Some of data might include student and/or teacher data, so designer should consider it and register the data in both parts.

Figure 4. Register Phase

Analyze

Analyze part of PID intends to analyze the data which were gathered and registered. It is preferable to manage these parts online. Therefore, data will be saved, gathered, and registered in a faster and easier way than if one would have to do it on paper. During this phase all the registered data should be analyzed systematically and divided in categories. It is expected that each category will have its own result. (see Figure 5). Each result should represent a brief summary of the analyzed data.

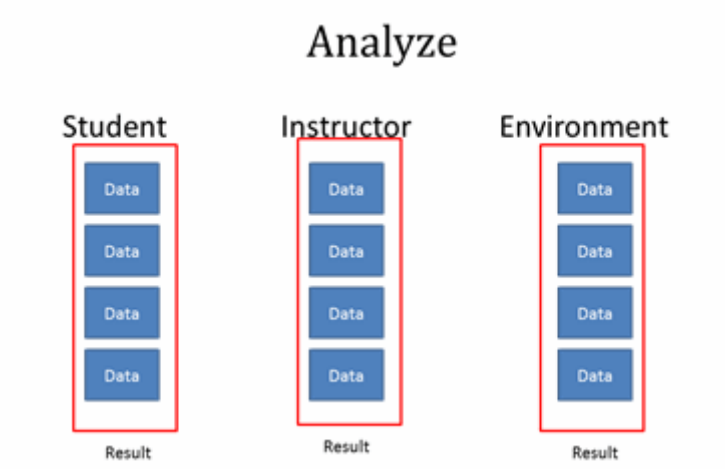

Figure 5.Analyze Phase

These results should also give enough information about each category. All result should be saved for same instructions to facilitate process. This also makes the result reusable. Reusability helps to facilitate process, build and save data cumulatively.

Program

This is the part of bringing everything achieved at the previous stages together in order to be introduced in the learning environment (See Figure 6). As mentioned above, this PID model is for online learning, so the facilities of online learning should be used.

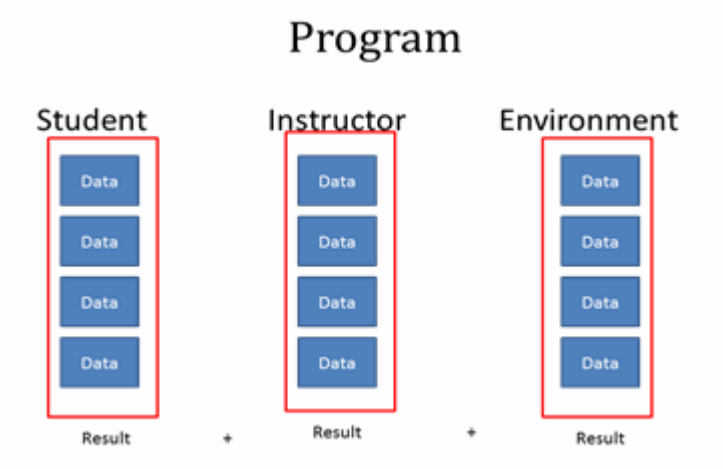

Figure 6. Program Phase

The majority of universities use learning management systems (LMS) for facilitating their online instruction such as Moodle, D2L, BlackBoard and so on. It can be time-consuming to create/design all over from the beginning. It also requires work of programmers and graphical designers. Therefore, using LMSs will be the best way to develop for instruction, because it is already created and designed for instruction.

It is important to choose correct and relevant materials for the instructions. Pedagogical content Knowledge of the teachers will help them to select the best materials for their students. Instructional designer are expected to have enough pedagogical knowledge and content knowledge, so they can work collaboratively across the disciplines. It is strongly suggested that they should work with an instructional designer during the instruction.

This part is also important for the course, because visual design should be appropriate and relevant. Colors should be chosen based on student characteristics and needs. Visual design theories may help to understand this concept better, so teachers and/or designers should know how to apply visual design theories.

The motivational strategies should be added in this step. Sarsar (2012) mentioned that instructors should pay attention students' motivation in online learning environment. The use of ARCS-V model of John Keller is strongly recommended as the most coherent motivational strategy available. ARCS-V model is one of the most transferrable motivational concepts into instructional design. Researchers have also noted that motivation is a strong predictor of success in online learning. Keller, 1999; 2008; 2010). Attention, relevance, confidence, and satisfaction (ARCS) is a model of motivational design which provides a systematic approach to designing motivational tactics for instruction (Keller, 1999). Keller came up with an expansion of the traditional ARCS model in his recent book. He called this expansion ARCS-V model. V related to volition. As Keller (2010, pp.7) says volition "is to the actions people take to achieve a goal". In addition, he supports this idea with pre-action planning and self-regulation or action-control. Please see the Figure.7 for Integration10 Steps motivational design to GRAPE model and ARCS Motivational Strategies.

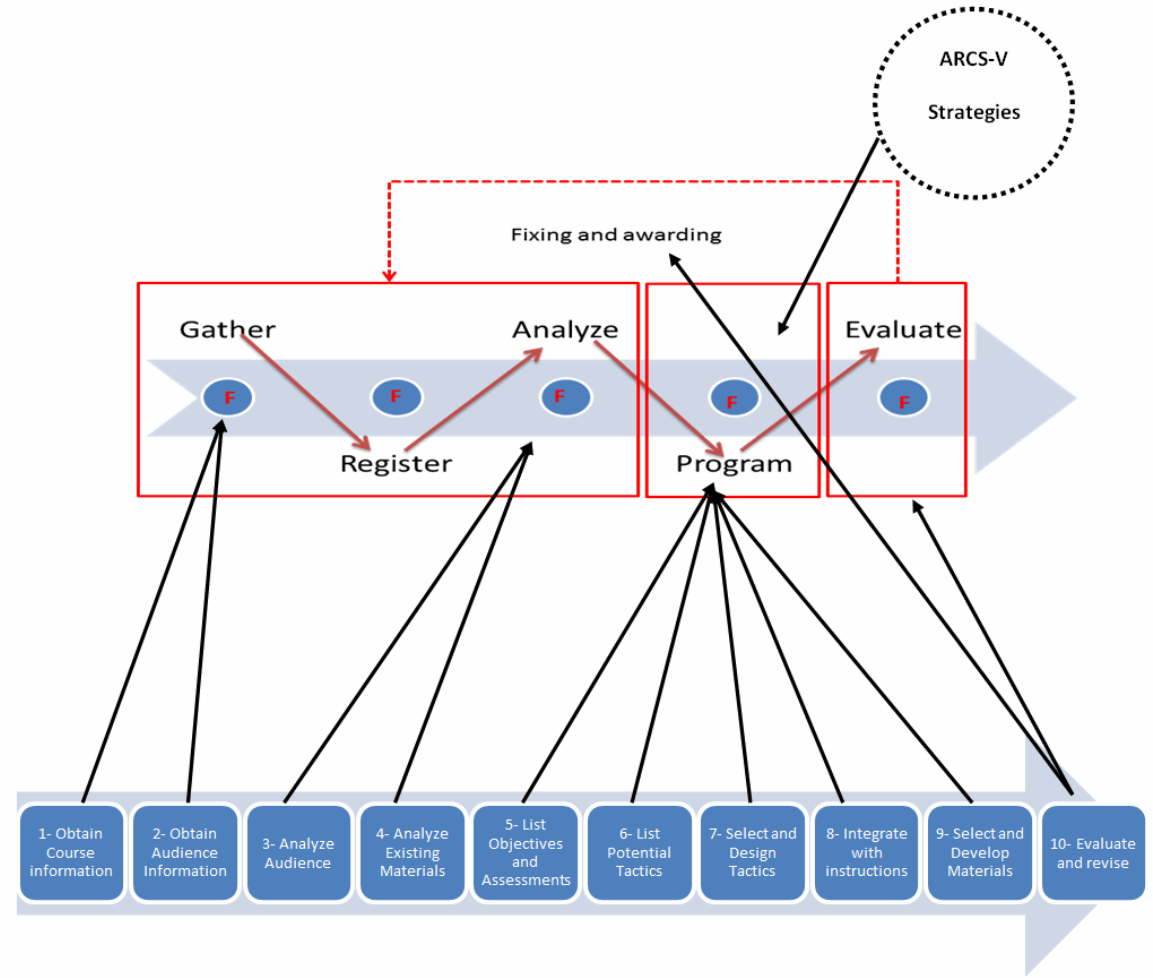

Figure 7. Integration 10 Steps motivational design and ARCS Motivational Strategies (Keller, 2010) to GRAPE model

Evaluate

This phase is divided into 3 parts. The goal of the first part is to evaluate students. Students can be assessed by using testing methods and strategies such as open-ended questions, quizzes, exams and so on. Second part is designed to evaluate teacher. This part is about evaluating the technological and pedagogical knowledge of teacher. It offers insights on how well they are able to manage instructions as well as what set of skills needs to be improved or strengthened. The third part of evaluation appraises the quality of designed learning environment. During this part, students and teacher are asked question about the design of the course and the structure of the course.

Feedback

Every step requires feedback. The feedback can come in form of a checklist, reflection and/or teacher memos. Feedback is helpful not only for students and teachers but also for the instructional designers to evaluate the flow of design process and to predict the next steps. If feedback unveils some gaps or missing points, teachers/designers can go to previous step and reprocess it.

Fixing and Awarding

This part represents one of the unique phases of the design. Fixing part asks to accumulate all the feedback and see what should be fixed. Awarding part is to give credits to the teachers, students and designers and acknowledge their success. These awards can come in the form of certificates, extra bonus grades and/or creating positive reputation for teachers and designers.

Game based learning can be one of the ideal strategies during the process. Players are awarded when they complete the task, thus following the same strategy. The teachers, students and instructor can be awarded with certificates, greeting cards, etc.

At the end of the process, if the instruction is completed in a very successful way, the instructional materials should be saved for re-using purposes. Therefore, the reusable course design will be saved for another course. It also saves time of instructors and teachers by preventing them from spending efforts and time on re-inventing the same content of instruction.

Strengths of GRAPE

GRAPE is extensive instructional design model and it can serve all level of online courses. In this framework instructional designers and teacher are encouraged to use Learning Management System for facilitating their teaching process. The most important aspect of the GRAPE framework is the amount of time and effort given to a careful and effective analysis of all data. The use of surveys and checklists is promoted. The other reason to use this design is the recycling feature that encourages saving all the documents and data to be used again. GRAPE strongly argues for the reusability of data, instructional materials and instructions.

GRAPE makes difference for those involved in instruction due to some of its features. Awarding is the unique process of the GRAPE. Other models have not explored the concept of giving credits to people who put their efforts and time in instruction. Awarding is the last phase of GRAPE. Awarding will create a positive reinforcement to encourage teacher, designers, and students do their work better.

GRAPE facilitates and encourages steam work. It assumes that teachers have minimal Technological Pedagogical Content Knowledge skills to control the instruction; however, better instructional design is created by instructional designers. Therefore, teachers and instructional designers should work as a group.

Grape also evaluates teachers and designers. The model believes that students' success or achievement is not the only indicator for the success of the instruction. Teachers should be evaluated by students and/or instructor, while this detailed attention to the efficiency of the instructional process takes into account the multiple variable of instruction. Designers are also expected to be evaluated by students and teachers on the environmental and design features as well as the flow of the instruction.

Limitations of GRAPE

GRAPE was designed as a linear system and as the result it is not as flexible as non-linear systems; however, its flexibility is found in transition between the steps allowing for a constant back and forth movement. The two main concepts are extensive when the framework gives unequal attention to analyzing and evaluating phases. GRAPE advises to get as much data as it is accessible to teachers and designers, so it makes the analyzing part extensive. This model argues for the necessity of evaluating not only students but also teachers and designers, so this process creates additional work on the evaluating phase. GRAPE process takes time as analyzing and evaluating part can be time-consuming. The rubrics or checklist should be designed in order to facilitate the process.

Another limitation of this framework is found in giving consideration to the background of teachers as their Technological Pedagogical Content Knowledge (TPACK) skills directly affect the instruction. If the TPACK skills are not extensive enough to manage the instruction, teachers are expected to take some workshops or read/listen/watch some tutorials for improving their skills.

This model also has to be experienced in online learning environment. It was created by using theoretical knowledge and personal experiences of the creator, so GRAPE should be used in online learning environment to test the efficiency of the model.

This model is likely to increase workload at the Program phase which incorporates the features of Design, Development and Implementation steps of ADDIE. Therefore it may appear that a number of processes going on at the same time; however, instructors and teachers can facilitate this process. For example, if the designer decides to create the learning environment instead of using LMS, it will enormously delay the beginning of instruction. Also, course material should be converted electronically and Web 2.0 tools should be used for course activities. These small tactics can make the step easier and ease the workload.

Conclusion

Instructional design is concerned with managing learning process to facilitate conceptual understanding. Instructional design models help to make this process efficient. GRAPE instructional design model is one of them. It gives a guide to teacher, students and instructional designers to aid their teaching, learning and design process. As all other instructional designs GRAPE has cons and pros. It should be experienced and improved by being applied to different online learning environments.

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Editor's Note: Relevant graphics can simplify communication and clarify meaning. Most of us are familiar with the ability of Excel to display results in graphic formats. At a much simpler level, the graphic calculator is an excellent resource for mathematics instruction. This study compares learning and comprehension of students using graphic calculators with those that did not have graphic calculators.

Effectiveness of Graphing Calculator Technology on Students' Understanding of Global Behavior of Rational Functions in a College Introductory Mathematics Course in Jordan: A follow-Up Study

Ahmad Moh'd Al-Migdady
Jordan

Abstract

Sixteen students who studied rational functions in an introductory mathematic course at a community college in Jordan with or without graphing calculators were interviewed. These interviews aimed at investigating students understanding of the global behavior of rational functions and searching for evidence regarding the extent to which their understanding was influenced by the availability of the graphical calculator. Overall findings suggest that the graphing calculator students had a clearer view of the global behavior of rational functions than the non-graphing calculator students. Most students from the graphing calculator group seemed to reason across representations when interpreting the global behavior of a rational function given its table of values. Also, there were more non-graphing calculator students who were unable to operate with the unknown to find the value of c in $f(x) = 1/x^2 + c$. Moreover, there were more graphing calculator students than non-graphing calculator students who were able to glean information from a partial graphical representation of a rational function. Classroom implications and suggestions for further research are included.

Keywords: technology, graphing calculator, global understanding, rational functions, asymptotes

Introduction

Educational reform documents issued by the National Council of Teachers of Mathematics (NCTM) such as the Professional Standards for School Mathematics (NCTM, 1991), Principles and Standards for School Mathematics (NCTM, 2000) and NCTM Curriculum Focal Points for Pre-kindergarten through Grade 8 Mathematics (NCTM, 2006) take the position that using technology such as computers and graphing calculators in mathematics classroom is essential for teaching and learning of mathematics. These documents indicate that technology enhances mathematics teaching and learning and shifts teachers' and students' attention from drill and practice of mathematical skills to more complex thinking skills such as mathematical problem solving, reasoning, connections, communication and representations.

Qualitative methodology was employed by mathematics education researchers such as Ackles, Fuson, Sherin,(2004), Al-Migdady(2005), Larsen & Marrongelle (2006), Longhbaum (2006),(Knott, Srirman, & Jacob (2008), Mesa (2008), (Tarmizi & Fouzi (2008), Kenney (2009), and Al-Migdady, All Aljarrah, & Khwaielh (2011) to provide insight regarding classroom environment recommended by those three NCTM documents. Overall findings indicated that employing NCTM visions changed the classroom climate, providing more investigation time by students and less lecture time by teachers. Also, other researchers such as Longhbaum (2000), Steying & Maree (2002), Cavanagh & Mitchelmore (2003), Hang (2004), Mousoulides & Gagatisis (2004), Kastberg & Leatcham (2005), Tat & Fook (2005), Tarmizi, Fouzi, & Yunis (2008), Bruder (2008), Kenny (2009), Al-Migdady et al., (2011) indicated that using technology

provides more time for the teacher and students to practice holistic analysis of algebraic functions and create multiple representations of them.

Based on different documents Issued by NCTM, the present study takes the position that the use of technology such as graphing calculators can be conceptualized as constructivist tools if they are used to encourage students be active participants in building their mathematical understanding. In this learning environment, the teacher and students role shift from producing graphs of given functions to writing explanations and questions of what the graphs are saying about. Instructors of mathematics courses at the college level, mathematics education researchers, and publishers of mathematics textbooks could benefit from findings of this study.

Methodology

Purpose of the Study

Al-Migdady et al (2011) conducted a research study that aimed at investigating the extent to which classroom discourse was influenced by the availability of the graphing calculator. Classroom observations were conducted at a college introductory graphing calculator mathematics course. This course is offered for non-mathematics-major students at a community college in Jordan. Overall findings of data analysis revealed a different classroom discourse, and the graphing calculator could be considered an important agent in creating a departure from teacher-centered instruction to student-centered.

As a follow up study, the current study was conducted to gather information regarding the extent to which students' understanding of the global behavior of rational functions was influenced by the availability of the graphing calculator. In particular, the main question of this study was to look for differences between students in the graphing-calculator group (GCG) and the non-graphing-calculator group (NGCG) in their work across functional representations, namely tabular, algebraic, and graphical representations.

Data Sources, and Analysis

A type of purposeful sampling called "Maximum Variation Sampling" was used. The teachers' information about their classes was considered when choosing four students (two from the GCG and two from the NGCG) who seemed to have a high level of functional understanding, four students (two from the GCG and two from the NGCG) who seemed to have a low level of functional understanding, and eight students (four from the GCG and four from the NGCG) who seemed to have a middle level of functional understanding. Those sixteen students (eight from the GCG and eight from the NGCG) who agreed to participate were interviewed, and permission from the teachers and students was obtained prior to the study. These interviews were tape-recorded and then transcribed. Each student was interviewed individually for about forty-five minutes. Each interview was designed around a major task that aimed to help the interviewer understands students' understanding of the global behaviour of rational functions. In the interview, a Think-aloud technique protocol was employed in which each student was asked to explain his or her reasoning aloud while solving three mathematics problems similar to those given in the textbook (Appendix A).

Initial coding of interview data was done after transcribing these interviews. This coding involved writing memos about the overall information of the interviews and the notes the researcher took during the interviews. Then, a second round of coding was done. This coding involved a line-by-line analysis of each interview in order to look for emerging themes. Finally, a third round of coding was done. This third coding involved checking for coherence across interviews in order to draw tentative conclusions about students' understanding of the global behaviour of rational functions and to search for evidence regarding the extent to which this was influenced by the availability of the graphing calculator.

Searching for such evidence, and based on the emergent themes across interviews, the following three analytical questions that served to guide the analysis were used:

1. Which format(s) of functional representations did students in both groups use to interpret the global behaviour of a rational function given its table of values?
2. What reasoning did students in both groups use to develop an algebraic representation of a rational function, given its table of values?
3. Given a partial graphical representation of a rational function, what reasoning did students in both groups use to create a representative table of that function?

Definitions of Terms Used in the Study

1. A rational Function: Is a function that can be written in the form f(x) = s(x)\t(x); s(x) and t(x) are polynomial functions and t(x) can not equal zero.
2. Functional Representations: There are three types of such representations: algebraic representations(letters, symbols, formulas). tabular representations(tables of values, ordered pairs). and graphical representations (diagrams, histograms, graphs).
3. Horizontal Asymptotes: A rational function f(x) = s(x)/t(x); has a horizontal asymptote if f(x) approaches a constant real number as x approaches plus or minus infinity. For example, $f(x)=(3x^2-x+10/(2x^2+4x+5)$ has a horizontal asymptote as x=3/2; because the limit is a fixed point (3/2). But if the limit is infinity there is no horizontal asymptote.
4. Students' Understanding of the Global Behavior of Rational Functions: This understanding includes the following:
    a) Students' use a table of values to determine: the X- and Y- intercepts, the increasing/decreasing and continuity regions, the point(s) of discontinuity, and the vertical and horizontal asymptotes.
    b) Students' use of a table of values to develop an algebraic representation of a rational function.
    c) Students' use of a partial graphical representation of a rational function to create a representative table of values that may represent the global behaviour of this function.
5. **Texas-Instrument (TI-85) Graphing Calculators**: Scientific calculators that have graphing capabilities. With these graphing calculators, students can produce a graph of a function by entering the scale of the axes and the rule of the function. Then, students may change the scales until they are able to see the graph on the screen. Also, with the "zooming in" facility, the students can view selected regions of the graph.
6. **Vertical Asymptotes**: A rational function has vertical asymptotes when its denominator equals zero. For example, f(x) = 1\(x+2) has a vertical asymptotes at x = -2 (when x+2=0). In this case as x approaches -2 from the left, f(x) approaches minus infinity, and when x approaches -2 from the right, f(x) approaches plus infinity. This means that the graph of this rational function splits at this discontinuity jumping from minus infinity to plus infinity.

Results of Data Analysis

The main question of this study is: Are their any differences between students in the graphing-calculator group (GCG) and the non-graphing-Calculator Group(NGCG) in their work across functional representations, namely tabular, algebraic, and graphical representations?

Three analytical questions that served to guide the analysis were used to answer this main question:

Results of Analytical Question # 1

Which format(s) of functional representations did students in both groups use to interpret the global behavior of a rational function given its table of values?

Rational functions can have three representations: algebraic, tabular, and graphical. To understand the global behavior of a rational function, one needs to be able to move back and forth between one representation and another. For example, from a table of values that represents a function, one can graph the function to understand its global behavior. To find the value of c in the function $f(x) = 1/x^2 + c$, using its table of values, one needs to work between the algebraic and the tabular representations of the function. Also, from a graphical representation of a rational function, one builds a table of values that may represent this rational function. In other words, if a student has an understanding of the global behaviour of rational function, he/she should not look at these representations separately. Instead, he/she should understand the connection between these representations in order to move back and forth across them.

The interviewed students from both groups were given a table of values that represented specific values of a rational function whose domain is the set of all real numbers except $x = 0$. They were then asked to explain the global behavior of that function (Appendix A: Problem # 1).

From the GCG, six out of eight students (75%) used both the tabular and the graphical representations of the function to interpret its global behavior, whereas only three out of eight students (37%) from the NGCG did similarly, while two students (25%) from the GCG relied only on the tabular representation of the function to interpret its global behavior, but five students (63%) from the NGCG did similarly.

The analysis of students' reasoning while working within the tabular representation of the function, or between the tabular and the graphical representations of the function revealed that some students have misconceptions about the global behavior of rational functions. Table(1) summarizes some of these misconceptions.

Table 1
Students' Misconceptions about the Global Behavior of Rational Functions

The Type of Misconception	GCG(N)	NGCG(N)
Considering all points given in the table as intercepts.	1	2
Using y-values instead of x-values to describe the increasing/decreasing and continuity regions	3	5
Using ordered pairs instead of intervals to describe the increasing/decreasing and continuity regions.	3	5
Misunderstanding the Difference Between the Vertical and Horizontal Asymptotes	4	6

Ali, a graphing calculator student, provided complete and accurate descriptions of the global behavior of a given rational function. He started by saying, "You might do the graph. But I know that the x-intercept occurs when $y = 0$. Hence, from the table, there is no x-intercept; which means that as x approaches plus or minus infinity, y approaches zero. Also, the y-intercept occurs when $x = 0$. Hence from the table, there is no y-intercept; which means that as x approaches zero, y approaches plus infinity.

Using the table of values, Ali provided correct descriptions for the x- and y- intercepts. But when he was asked to determine the increasing/decreasing and continuity regions and find the points of discontinuity, and determine the horizontal and vertical asymptotes he decided to graph these

points and worked between the tabular and graphical representations of this function and provided accurate descriptions of these characteristics.

Nadeen, another graphing calculator student, started by graphing this function and worked between the tabular and the graphical representations and provided accurate descriptions of the x- and y-intercepts. But she thought that plus and minus infinity are the same as increasing and decreasing respectively, and did not understand the difference between the Vertical and Horizontal Asymptotes.

On the other hand, five students (63%) from the NGCG relied only on the tabular representation of f(x) to describe its global behavior. Those students provided incomplete or inaccurate descriptions of the global behavior of this function. For example, Sammer thought that f(x) had two different x-intercepts and one y-intercept instead of non. He also used ordered pairs instead of intervals to describe the increasing and decreasing regions of f(x). Also, he did not understand the difference between the Vertical and Horizontal Asymptotes.

In sum, there are more graphing calculator students than non graphing calculator students who worked between the tabular the graphical representations. Further, more graphing calculator students provided accurate and complete descriptions of the global behaviour of a rational function with fewer misconceptions than non graphing calculator students.

Results of Analytical Question # 2

What reasoning did students in both groups use to develop an algebraic representation of a rational function, given its table of values?

Finding the value of c in a given function like $f(x)= 1/x^2 + c$: x#0 involves students' ability to work between the tabular and the algebraic representations of f(x). In addition, this process involves students' understanding of the relationship between x and y.

The interviewed students from both groups were given $f(x) = 1/x^2 +c$: x#0, where c is a constant real number, a table that represents specific values of x and f(x) and were asked the find the value of c (Appendix A: Problem # 2).

From the GCG, six of eight students (75%) seemed to understand the relationship between x and y by working between the tabular and the algebraic representations of f(x) and finding the correct value of c. On the other hand, only four out of eight students (50%) from the NGCG seemed to understand the relationship between x and y.

Table 2 summarizes the reasoning used by students from both groups when working between the tabular and the algebraic representations to develop an algebraic representation of a rational function given its table of values

Table 2

Reasoning Used by Students from Both Groups when Working Between the Tabular and Algebraic Representations of a Given Rational Function

Reasoning Used by Students from Both Groups	GCG(N)	NGCG(N)
Using only one ordered pair to find the Value of C.	4	6
Using one ordered pair to find the value of c, then the others to check the result	3	0
Graphing the Points	1	0
Using only the x-value to find the Value of c.	0	2

From the GCG, Ali, Nadeen, Salwa, John, Sammi, and Bill used the second ordered pair given in the table,

(-1,3), to find the value of c. They obtained the correct value of c. In addition, Ali, Nadeen, and John used the other three ordered pairs given in the table, (-2, 2.25), (1, 3) and (2, 2.25), to make sure that they obtained the correct value of c.

From the NGCG, Ahmad, Lila, Sammar, Fatten the four students who obtained the correct value of c. For example, Lila said, "I think I can plug in the value of x... If x = -2, then 1/4 + c = 2.25 That would make y. And y = 2.25 which is 1/4 + c =2.75. So c would be 2."

Bill and Sammi were the only two students from the GCG who could not get the value of c. They started by making a graphical representation of this function using the four ordered pairs given in the table, then said "we do not know.". On the other hand, Four students from the NGCG (Mark, Moh'd, and Fatten, and Lila) did not know how to find the value of c. All of them did not understand how x and y are related to the function. Also, Mohh'd and Fatten used the x-value to find the value of c, where in fact they needed the x- and y-values for a given ordered pair to find the value of c.

In sum, the ability of the graphing calculator students to work between the tabular and the algebraic representations of a rational function was better than the non graphing calculator students; there were more graphing calculator students who found the correct value of c. Moreover, some students from the graphing calculator students used the second ordered pair to find the value of c and the others to check that they got the right answer, but no one of the non graphing calculator students did similarly.

Results of Analytical Question # 3

Given a partial graphical representation of a rational function, what reasoning did students in both groups use to create a representative table of that function?

In order to get a complete description of a rational function, students need to estimate ordered pairs that show its global behaviour (the x- and y-intercepts, the increasing/decreasing and continuity regions, points of discontinuity, and the horizontal and vertical asymptotes). In other words, students' ability to create a table of values that may describe the complete graph of a rational function given its partial graph reflects their understanding of the connection between the graphical and tabular representations of the function.

The interviewed students from both groups were given a partial graph of a rational function, and were asked to create a table of values that may represent this function(Appendix A: Problem #3).

Table 3 summarizes types of points estimated by students from both groups.

Table 3
Types of Points Estimated by Students in Building a Table of Values for a Rational Function Given its Partial Graph

Estimated Points that Describe	GCG(N)	NGG(N)
X- and Y-Intercepts	8	8
The Horizontal Asymptote	5	3
The Vertical Asymptote	5	3
Discontinuity	4	3
Several Other Points	5	3

This table shows that all students from both groups were able to estimate points that describe the x- and y-intercepts; they indicated that there is no x-intercepts but there is a y-intercept. Also, five students (63%) from the GCG and three students (37%) from the NGCG estimated points that describe the horizontal and vertical asymptotes. Moreover, four students from the GCG (50%) and three students (37%) from the NGCG estimated the points of discontinuity. Finally, five students from the GCG (63%) and three students (37%) from the NGCG estimated extra other points that may show its complete behaviour.

Students from both groups also differed in their reasoning when building a table of values for a rational function given its partial graph, which is summarized in Table 4

Table 4
Reasoning Used by Students from Both Groups when Building a Table of Values for a Rational Function Given its Partial Graph

Reasoning Used	GCG(N)	NGCG(N)
Making Up Some Points	8	4
Memorizing the General Shapes of Specific Functions	0	4

The following quotes exemplify the reasoning provided by John (a student from the GCG), and Lila (a student from the NGCG).

> **John**: "I have to do the scaling first. The most important points are the x- and the y-intercepts, and some other points before and after the asymptotes ... It is easier to go from left to right." He showed the following ordered pairs on the given graph:(-4,1.5), (-3, 2.5), (-1, -1),(0,-1/2),(2,1.25), (3,1). Then he wrote these points on a table of values. Also, he mentioned that the function has no x-intercept, but it has one y-intercept. Moreover, he indicated that the function has one horizontal asymptote at y=1, two vertical asymptotes at x=-2 and x=1, and is discontinuous at x=-2 and x=1.

> **Lila**: "I have lacked the experience of tabular representations of functions. I always memorize the general shape for some graphs. If the graph is on the graph points, you can count the points and find the x- and y-coordinates. If x = -4, y would be 2.5. If x = -3, y would be 2.5. If x = -1, y would be -1, and if x = 0, y would be -1.". Moreover, she mentioned that the function has no x-intercepts but it has one y-intercept, but she did not understand the difference between the horizontal and vertical asymptotes. Also, she was unable to determine the points of discontinuity.

In sum, the ability of the graphing calculator students to work between the graphical and tabular representations of a rational function was better than the non-graphing calculator students; there were more graphing calculator students who estimated different points that represent a rational function given its partial graph.

Discussion of Findings and Conclusions

This study was conducted to gather information regarding students' understanding of the global behaviour of rational functions and searching for evidence regarding the extent to which their understanding was influenced by the availability of the graphing calculators. Overall findings indicated that major differences seemed to exist between students in the graphing and non-graphing calculators groups in their reasoning when solving aloud three mathematics problems about the global behaviour of rational functions, and the graphing calculator could be considered an important agent in helping graphing calculator students build a better understanding of the

global behaviour of rational functions. These findings suggest that the graphing calculator students had a clearer view of multiple representations of rational functions.

Three possible reasons could be given as evidence to support the conclusions made. First, major differences appeared to exist between students from both groups in their work across functional representations. Students from the non-graphing-calculator group seemed to look at the functional representations separately; they rarely worked across representations when interpreting the global behaviour of a rational function given its table of values. On the other hand, most students from the graphing- calculator group seemed to reason across functional representations; they worked across representations when interpreting the global behaviour of a rational function given its table of values. A possible explanation of this finding is that the graphing calculator offers students opportunities to become more successful in translating information across functional representations. This result is consistent with overall findings of other research studies such as Longhbaum (2000), Hang (2004), Kastberg & Leatcham (2005), Larsen & Marragelle (2006), and Mesa (2008) which indicated that graphing-calculators students draw their conclusions about functions based on multiple representations of function, whereas non-graphing- calculators students tended to reason and draw their calculators about functions based on the given representation and rarely reasoned or drew conclusions across functional representations.

Second, there were more non-graphing-calculator students than graphing-calculator students who were unable to operate with the unknown to find the value of c in $f(x) = 1/x^2 + c$. A possible explanation of this finding is that the graphing calculator offers students opportunities to become more successful in translating information between the tabular and algebraic representations of rational functions and see how x and y are related to the function. This result is consistent with overall findings of other research studies such as Longhbaum (2000), Steying & Maree (2002), Tat & Fook (2005), Bruder (2008), Tarmizi, Fouzi, & Yunis (2008), and Kenney (2009) which indicated that the use of graphing calculators helped students develop multiple representations of functions and develop their algebraic expressions.

Third, It seemed that reading information from the graph is not obvious, especially when a student did not see the connection between the tabular and graphical representations of a given rational function. But using the graphing calculator enhanced students' visualization of functions which helped them glean more information and build a table of values from a partial graphical representation of a rational function. A possible explanation of this finding is that the graphing calculator offers students opportunities to become more successful in translating information across functional representations and reduced their need for memorizing geometrical shapes of specific functions as the case of some non-graphing-calculator students who developed strategies of memorizing general shapes of specific rational functions. This result is consistent with overall findings of other research studies such as Steying & Maree (2002), Cavanagh & Mitchelmore (2003), Kastberg & Leatcham (2005), Bruder (2008), and Kenney (2009) which indicated that using graphing calculators helped students focus on more analysis of functions which helped them developed a better understanding of the global behaviour of these functions.

Classroom Implications and Suggestions for Further Research

Based on the results of this study and the discussions made, many classroom implications and suggestions for further research could be made. Some of them are:

1. Graphing calculators provide visual representations of functions. Therefore, they are practical tools that could be used successfully in algebra classes on helping students build concrete representations of abstract concepts in algebra.
2. Some of the students interviewed from the non-graphing calculator group indicated that they lacked the experience of tabular representations of functions because there was no

emphasis on tables in the class. This study suggests that more emphasis is needed on helping non-graphing calculator students understand how to build and use tables of values to interpret the global behavior of rational functions. This might increase their ability to translate information across functional representations and reduce their need to memorize general shapes of functions.

3. Most students from both groups seemed to neglect both the verbal description of functions and the use of precise mathematics language when describing the global behavior of rational functions. This study suggests that more emphasis is needed in this area.

Suggestions for Further Research

1. This research investigated students' understanding of the global behaviour of rational functions and searching for evidence regarding the extent to which was or was not influenced by the availability of the graphing calculator. This type of rational functions might have vertical or horizontal asymptotes which is easier to work with than other types of functions that might have oblique (slant) asymptotes such as f(x)= (x2+x+1)/(x+1) or parabolic asymptotes such as f(x) = (x3+2x2+3x+4)/(x). This study recommends research studies that investigate the effects of graphing calculators on students' understanding of the global behaviour of such functions.
2. As this study showed that there was an effect for the graphing calculators on students understanding of the global behaviour of rational functions in a college introductory course offered for non-mathematics major students. It is appropriate for other researchers to investigate the effectiveness of the graphing calculators on students understanding of more advanced mathematics courses offered for mathematics-major students.

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Appendix 1

Problem # 1:

The following table represents specific values of a rational function f(x) whose domain is the set of real number except x = 0.

X	-∞	-3	-2	-1	0	1	2	3	+∞
F(x)	0	1/9	¼	1	∞	1	¼	1/9	0

1. Write the coordinates (if any) of the x-intercept(s).
2. Write the coordinates (if any) of the y-intercept(s).
3. Find (if any)the vertical asymptotes of this function.
4. Find (if any)the horizontal asymptotes of this function.
5. Give the domain of this function and determine the region on which this function is not continuous.

Problem # 2

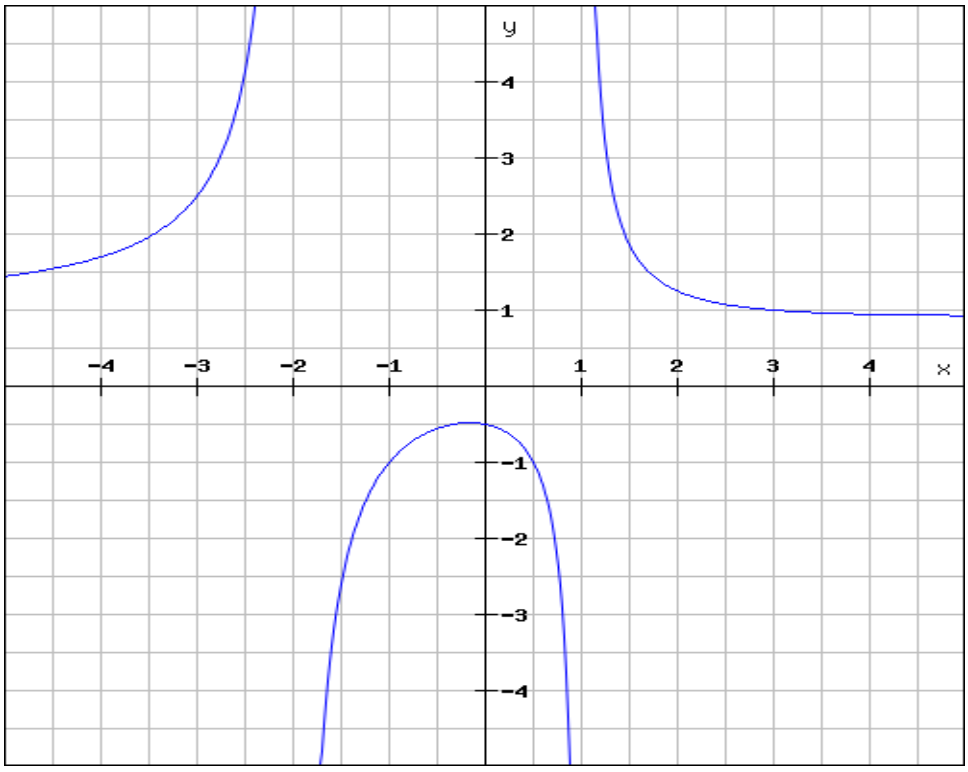
Given $f(x)=1/x^2 +c$, where c is a constant real number. The following table represents specific values of x and f(x):

X	-2	-1	1	2
F(x)	2.25	3	3	2.25

Determine the value of c in this function.

Problem #3:

The figure given below represents a partial graph of a rational function f(x).



Create a table of values that may represent the total behaviour of f(x) as shown in this figure.

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Editor's Note: For most students, experience builds confidence, and success with certain patterns of communication will influence future preferences. This study examines these relationships in learning English as a Foreign Language in Iran.

The Interplay of Proficiency Level and Communication Apprehension among EFL Learners with a Look at their Preferences of Communicative Tasks

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Abstract

The current paper was an attempt to research the frequently-studied issue of communication apprehension (CA) from a different window. It tried to shed light on two points: first, if there is any correlation between the EFL learners' proficiency level and their CA; and second, what communicative tasks are more favored for each of three groups of learners, To fulfill the intended objectives, 120 Iranian EFL learners, based on their availability, were selected and given a test to place them into three groups (beginning, intermediate, and advanced) using two questionnaires (one about CA and one about communicative tasks). Having analyzed the gathered data through correlation and descriptive statistics, the study revealed a strong negative interrelationship between the proficiency level of learners and their level of CA. The study also showed that the CA level is highest among beginning language learners and lowest among advanced language learners. Finally, it was understood from the study that different communicative tasks such as group discussion, role-playing, and story-telling are preferred by learners with different levels of proficiency. The detailed findings are presented in the body of this paper.

Keywords: Communication apprehension, Proficiency level Communicative tasks, EFL learners

Introduction

Many learners at different levels of study experience some level of stress and anxiety when they are required to communicate, especially in public. This feeling of anxiety and stress when communicating is referred to as communication apprehension (CA). It is a fear or anxiety about actual or anticipated communication with other individuals, and is a feature or better to say, a trait pertaining to the psychological constructs of shyness and reticence (McCroskey, 1984). Communication apprehensive persons usually choose avoidance and withdrawal behavior and are therefore less likely to be involved in oral communication (Scott & Rockwell, 1997). Communication apprehension is related to both cognitive processes (Ayres, 1990) and psychological perceptions (Ayres, 1986).

Some researchers, like Opt and Loffredo (2000) have reported that there may be a hereditary contribution to CA. To clarify the point, McCroskey (1984) explains that research into twins has provided evidence that something other than environmentally based learning impacts on human behavior tendencies and those important social traits, like sociability, can be measured in children after birth and that there are significant differences on these traits. The interaction between heredity and environment is seen as a precursor of adult predispositions and tendencies such as CA.

Furthermore, CA takes place in a range of contexts and often leads to negative outcomes not only for speakers but for listeners. These statements can well indicate the significant role of communication apprehension. Therefore, it is a must for language teachers to address it especially in EFL settings. This is because those who have already some degree of CA in their native

language will encounter more anxiety when communicating in a foreign or language, such as English (Schlenker & Leary, 1982).

The last point in this section is that, communication apprehension (CA) has been researched in a variety of different communication research contexts: instructional communication (McCroskey & Sheahan, 1978), pharmacy student education (Baldwin, McCroskey, & Knutson, 1979), organizational communication (Richmond & McCroskey, 1985), interpersonal communication (McCroskey, Daly, & Sorensen, 1976), and many others. However, it seems that it can also be studied in terms of many other conditions and in relation to many other topics especially in EFL contexts in which, unlike ESL contexts, a lack adequate studies on CA is strongly felt. One of these areas is the issue of the present study; that is, existence or lack of existence of any CA among EFL learners and also it's' relationship with their proficiency level.

All in all, the following research questions are to be addressed in this study:

1. Is there any significant relationship between the EFL learners' CA and their proficiency level?
2. What is the degree of CA among EFL learners?
3. What are the most preferred communicative tasks among EFL learners?

Background

It is axiomatic that language is mainly used to communicate and also to get something done. One may want to carry out some important tasks in classroom such as having a good rapport with each other, or conveying their meaning by different ways like having a lecture, or having a small conversation or even having an oral presentation. In addition, the most obvious manifestation of learning a foreign or second language is the ability of learners to speak the language accurately and fluently in different contexts and also to be able to communicate their ideas clearly to other individuals who speak the same language. Therefore, in many settings knowing a language is equated with speaking that language impeccably.

Communication Apprehension (CA) is one of the most often-studied issues in the field of communication studies. McCroskey (1970) recounts that communication apprehension originally focused on communication-bound anxiety. However, recently the scope of CA has greatly expanded during the last decades. McCroskey (1977) later on defines CA as “an individual’s level of fear or anxiety associated with either real or anticipated communication with another person or persons” (p. 78).

Furthermore, communication apprehension can be measured by McCroskey’s (1982) Personal Report of Communication Apprehension-24 (PRCA-24) scale. This scale takes into account four different contexts in which CA can occur: interpersonal, meeting, group, and public. Interpersonal CA is the level of fear or anxiety pertaining to real or expected communication with another person in a one-on-one conversation. In fact, if someone experiences stress while thinking about interacting with another person or during an actual interaction with another person, he or she has interpersonal CA. The second and third types of CA, meeting and Group CA, investigate the level of fear or anxiety related to either real or anticipated communication with another individual or individuals in a small group like a class. Each of these kinds of CA is contextual-dependent. It means that depending on the specific conditions of a situation, a specific kind of CA may occur. Finally, Public CA is the level of fear or anxiety associated with either real or anticipated communication with another person or persons in a formal speaking context. The last point with regard to the four levels of CA is that, as Beatty, McCroskey, and Heisel (1998) rightly state, each of these four contexts are highly related with one another and may not be considered as separate from each other.

In addition, studies like McCroskey (1984) revealed that exposing persons to contexts designed to increase their communication abilities only works if they have pre-existing low levels of CA. Students with high levels of CA might not only fail to develop such skills, but exposing them to such a situation increases their anxiety, and consequently decreases their learning.

In contrast to CA communication ability may be stood. That is, there are some distinctions between communication apprehension and communication ability. A set of studies have concluded negative relationships between apprehension and communication ability, and cognitive ability (McCroskey & Andersen, 1976; Richmond & McCroskey, 1985). These studies have reported that lower grade-point averages and lower college entrance exam results are from the individuals suffering from higher levels of CA. There are, of course, some studies which, unlike the above-cited studies, do not prove the existence of such an opposite relationship between CA and communication abilities. Carrell & Willmington (1998), for example, observed no relationship between self-reports of communication competence and ratings of communication competence, and between self-reports of communication apprehension and observer ratings of communication competence.

Furthermore, tasks, especially communicative tasks, encourage learners to communicate with each other in real time. Due to the immediate pressures of spontaneous communication in tasks, learners have to simultaneously focus on both form and meaning. Since humans' processing capacity is limited (Anderson, 1995) and meaning is prioritized over form (Van Patten, 1990), manipulating learners' attention to focus on linguistic forms has become a key priority in research. Repetition is a task performance condition that can manipulate learners' attention through freeing up processing resource capacities. Bygate's work in the last decade has shown that in monologic tasks, repetition involves a special type of rehearsal where the learners can relate the repeated performance 'to information kept in the long term memory store' (Bygate, 2001). When they have the chance to repeat a task, learners can shift their attention to produce more complex grammar, more appropriate vocabulary, and they can generally organize and optimize their language resources more effectively (Gass, Mackey, Alvarez-Torres., and Fernandez-Garcia, 1999; Bygate, and Samuda. 2005). When learners are exposed to interactive tasks, they can rely on their previous performances of the same task to a limited extent only since their interlocutor's contributions will always bring some novelty to the joint interaction. Interactive task solutions are co-constructed and speakers need to satisfy their interlocutors' needs in addition to monitoring their own performance.

One important aspect of interactions in tasks is the need to collaborate effectively with a partner and this requires an appreciation of the partner's needs. Children's overall ability to take their partner's needs in peer-peer interactions grows with age (Azmitia, 1988). Research in L1 development indicates that different age groups learn to cope with demands needed for peer–peer interactions gradually as they mature (Nelson, 1996; Anderson, and Lynch, 1988). Young children often rely on adults to manage conversations for them (Scarcella, and Higa, 1981). In the absence of the adult partner, when they are communicating with other children, they show weaknesses both as speakers and as listeners. As speakers they have difficulty in constructing unambiguous messages and as listeners they can't judge the adequacy of incoming messages (Lloyd, Baker, and Dunn, 1984; Robinson, E. J. and Robinson, 1983). The ability to take full responsibility for ones' own utterances as well as understanding partners' utterances are skills gradually increasing with age. All these developmental findings influence interaction in second or foreign languages and research in child second language learning clearly reflect these developmental influences. Studies involving child subjects working in pairs with other children or with adults have been carried out in different contexts (Oliver, 1998; Ellis, 1985) and these studies have investigated various interactional processes, such as giving and utilizing feedback, question formation and meaning negotiation. The results indicate that children benefit from

interacting with both peers and adults and with both native speakers and non-native speakers interlocutors but both learner age and interlocutor type are important variables. Mackey and Silver (2005) claim that second language acquisition research finding should not be generalized to children without adequate empirical evidence. However, little is known about peer-peer interactions of different age groups especially in EFL contexts, that is, what children can cope with and benefit from.

Method

Participants

Altogether, 120 Iranian EFL learners took part in the study. They were both male and female, ranged from 16 to 23 in age, and sampled using availability sampling procedure. The participants were divided into three beginning, intermediate, and advanced level groups based on their scores on the placement test given to them. After giving the test, it turned out that 42 of the participants were placed in the low, 48 in the intermediate, and finally, 30 of them in the high level of ability groups.

Instruments

To achieve the intended data of the study, three questionnaires were utilized. The first instrument was a placement test administered to divide the learners into three groups of beginning, intermediate, and advanced. It was a reduced, modified form of TOEFL test which contains vocabulary and reading sections. Regarding the reliability of the test, KR21 was used and it turned out to be .87. And for the validity of the, they were examined and confirmed by three related professors of Shahrekord University.

The second instrument was a questionnaire developed to get knowledge regarding what type of communicative tasks the learners of the study prefer to be involved in. The questionnaire consisted of 30 items on different types of communicative tasks. The last point is that the questionnaire was in the Likert-scale format ranging from one to five (1= always, 2= often, 3= sometimes, 4= rarely, and 5= never).

In addition, the reliability of the instrument was checked using Cronbach alpha which turned out to be 0.84. For its validity, the face and content validity of the questionnaire was examined by some seasoned professors of Shahrekord University and they confirmed the questionnaire to be valid for the study purpose.

Regarding the second instrument, it was a questionnaires adapted from McCroskey (1982), known as PRCA-24 which was employed to determine the level of CA among learners. The PRCA-24 is a widely-used instrument for the measurement of CA. It composed of 24 items about feelings concerning communicating with others. To be more exact on the items, 13 items are related to the student's uncomfortable feelings about communication in English, and other 11 items focus on the student's enjoyment when communicating in English. The questionnaire is in a five-scale Likert format whose choices range from 1 (SA=strongly agree) to 5 (SD= strongly disagree). Having computed the learners' responses using the scoring guideline of the questionnaire, scores between 83 and 120 indicate a high level of communication apprehension. Scores between 55 and 83 indicate a moderate level of communication apprehension. Scores between 24 and 55 indicate a low level of communication apprehension.

Like the previous instrument, Cronbach alpha was used to calculate the reliability of the questionnaire which finally turned out to be almost .89. Furthermore, its content and face validity was also affirmed by the above-cited professors of Shahrekord University.

Data Collection

To gather the required data, first of all the author of the study distributed the questionnaire including items about different types of communicative tasks. They were asked to read the items carefully and then select the choice that best matches their preferences. No time limitation was set for their responding to the items; so that, they would read the items with more care and therefore the reliability of their responses would, in turn, increase.

Then in the second stage of the study, the other questionnaire (PRCA-24) was distributed among the EFL learners and they were asked to respond them (without any time limitation again).

Data analysis

After collecting the data, in order to analyze the, the author ran SPSS version 16 in general and a correlation, descriptive statistics and frequency programs in particular. The purpose of running them was employed to compute the means and standard deviations for each item.

Results and Discussion

This section of the study deals with the results obtained from the analysis of gathered data. This section consists of three sub-sections, each relating to one of the research questions mentioned earlier in the study.

Relationship between CA and proficiency level

Table 1 reflects the results of correlation ran for answering the first research question which dealt with the existence or lack of existence of correlation between CA and proficiency level of learners.

Table 1
Correlation between CA and Proficiency

		CA	Proficiency
CA	Pearson Correlation	1	-.788**
	Sig. (2-tailed)		.000
	N	120	120
Proficiency	Pearson Correlation	-.788**	1
	Sig. (2-tailed)	.000	
	N	120	120

**. Correlation is significant at the 0.01 level (2-tailed).

As the table reveals, firstly, there is a strong negative relationship between the two mentioned variables (r = .78). Secondly, a significant difference is observed between the learners' CA and their Proficiency level (p= .00 < .5). It indicates that language learners with high proficiency abilities enjoy less degree of CA, while the learners with lower proficiency capabilities suffer remarkably from CA and vice versa.

Degree of CA among EFL learners

To ascertain the relative degree of CA among learners, Table 2, representing the mean and SD of three groups of learners, is brought.

Table 2
Descriptive Statistics of EFL Learners

	N	Mean	SD
Beginning	42	14.42	2.11
Intermediate	48	9.46	1.02
Advanced	30	5.13	.78

As the table reveals, the level of CA among the beginning-level Persian EFL learners is very high (M=14.42). For the intermediate learners the same index is lower than for beginnings (M= 9.46). It means that intermediate learners are less engaged with CA than beginning-level learners. Finally the CA level for advanced-level learners is the least among the three groups of learners (M= 5.13).

Some justifications may be made for such findings. For example, beginning learners and also intermediate learners suffer from higher levels of CA due to the fact that many of them hated participating in public speaking. They may suffer from negative feelings of tense and nervous when engaging with new people in group discussions. Besides, these feelings of anxiety and stress may be related to their low level of proficiency and consequently, their inability to make themselves completely and exactly understood. In contrast, advanced-level learners have lower levels of CA because of factors such as comfort (which may be because of their acceptable level of proficiency in target language) when using English during class discussion (Daly & Friedrich, 1981). These learners, in fact, are not afraid to express themselves in discussions, even when conversing in English with new acquaintances.

EFL learners' communicative task preferences

Lastly, with regard to the third research question of the study which is to find the most preferred types of communicative tasks among EFL learners, Table 3 clearly reveals the response of this question.

Table 3
Preferred Communicative Tasks among EFL Learners

	Group discussion	**Meetings**	**Dialogue**	**Speech**	**Role playing**	**Story telling**
Beginning -level	3%	9%	16%	2%	34%	36%
Intermediate -level	36%	20%	19%	18%	3%	4%
Advanced -level	33%	9%	44%	9%	4%	1%

As with the beginning level learners, they are more likely to take part in story-telling, role playing, and dialogue activities respectively. In contrast they are not much willing to deliver a speech, to discuss about a topic in a group, or take part in meetings. Peck (1995) rightly states that beginning and young learners are more likely to play with language in comparison with adults and advanced-level learners. Besides, they use their senses like touching sense, hearing, and sight more often than other individuals. Therefore, tasks like story-telling and role playing which require much energy, enthusiasm, and involvement on the part of learners are likely to be favored by children than adults.

In addition, as far as intermediate learners are concerned, tasks like group discussion, meetings, dialogue, and speech have been selected by them to be the most preferred types of communicative tasks. It may be due to the fact that intermediate language learners are more willing to focus and think on the language, to use their cognition and cognitive capabilities rather than playing with it. They like to be first sensible and then emotional. Furthermore, another reason, the author of the paper thinks that may be due to their English learning experiences in Iranian schools and institutions. In other words, because the education system is examination-oriented most learners, especially in intermediate and higher levels learn English through intensive courses and sample examination papers. Therefore, they need to think more deeply on the lessons and be more deliberate with different aspects of language. The responsibility of learning in this kind of educational system is also more on themselves than on class and teachers. The last reason for their preference of group discussion task as the most preferred activity could be simply the fact that group discussion is usually done by similar group persons who motivate other participants to express their opinions. As with meeting task, because as Richmond (1976) assert, learners often prepare what to say before taking part in the meeting they feel less nervous and anxious. In addition, meeting's agenda is often distributed before it begins.

Finally, with regard to advanced-level learners, Dialogue, and group discussion are the most preferred communicative tasks. Meeting and speech have been selected equally for them and storytelling and role playing have been noticeably ignored by them. One justification which may be made with regard to this finding can be due to the point that that in advanced-level learners' perspective not being able to use language like a native speaker (after so many years of study) is annoying and they may feel uncomfortable about their not fluent, accurate, and complete. Thus, they try to use language authentically and in activities which are similar to target situations. Furthermore, regarding dialogue task, because in this kind of task the given topics are interesting and often selected with the consultation of learners themselves, they are more likely to take part in the talks.

Conclusion

The present paper tried to consider the frequently-studied issue of communication apprehension (CA) from a different angle. It tried to see first what differences are between beginning, intermediate, and advanced-level language learners in terms of CA; and second, given the differences between the three groups of learners, what communicative tasks are more favored for each of the groups. Having collected and analyzed the gathered data, some findings were resulted. Firstly, the study revealed that there is a strong negative correlation between the proficiency level of learners and their level of CA. Secondly, it was also understood in from the study that the CA level is the highest among beginning learners and then among intermediate and finally the CA is the lowest among advanced language learners. And thirdly, the study showed that different communicative tasks are preferred for learners with different levels of proficiency. In other words, beginning learners who are often dynamic and energetic prefer tasks in which they are required to be active and dynamic (tasks like storytelling, role playing). Intermediate learners, in contrast, prefer tasks in which they are pushed to think and use their cognition (Tasks such as group discussion, meeting, and dialogue). Finally, for advanced language learners, tasks which resemble authentic situations are favored (dialogue and group discussion tasks for example).

The study also enjoys a set of pedagogical implications. The first implication which may be drawn is that almost all learners suffer from negative feelings including stress, anxiety, and inhibition in the classroom. Besides, these kinds of feelings mostly stem from their tasks in which they should do a task in front of the class or in a group. Given the fact that these negative feelings may severely affect learners' learning process, teachers need to take the affective factors of the students into consideration in order to ensure effective communication. They can improve

learning environments by providing calm and stressless atmospheres for learners, which can make them feel safe to speak or express their views. Besides, they should eschew giving negative evaluations and should instead focus on learners' behaviors with more encouragement.

Finally, there are naturally limitations to the tentative claims made in this paper. Limitations include the choice of a set of specific tasks and a specific teaching/learning and cultural context. Research with different tasks, more learners in different contexts would be essential to make much more comprehensive, accurate, and reliable findings on the issue.

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