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Mandatory Use of TurnItIn: The Effect of a Policy on Reducing Unoriginal Writing in Online Classes

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Abstract

An accredited online university in the United States of America implemented TurnItIn similarity index rates in online classes in order to reduce unoriginal writing of online graduate and postgraduate students. The research problem was the lack of empirical research-based findings on the implementation of TurnItIn on reducing unoriginal academic work in online classes. The purpose of this research was to examine the similarity index rates, found in each TurnItIn report of each student's assignment submitted to www.TurnItIn.com in order to minimize unoriginal student writing. This study was grounded in the social learning theory of Vygotsky. The research question that guided this study was "What is the impact of the implementation of TurnItIn on reducing unoriginal writing in online classes of graduate and postgraduate students?" Archived data containing the similarity index rates of TurnItIn reports were collected for two cohorts of 111 graduate and 107 postgraduate students before and after the implementation of TurnItIn reports in online classes. The findings revealed that the implementation of TurnItIn reduced unoriginal writing in graduate and postgraduate online classes. A significant difference between the means of the two cohorts of similarity index rates of TurnItIn was found. The empirical evidence was that the implementation of TurnItIn has helped the online institution at the research site to reduce unoriginal writing. Education stakeholders may use these findings to improve academic integrity.

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² Research paper pertains to the Online Institute of Higher Education and Academic Integrity

Keywords:

online education, graduate and postgraduate online courses, online institutions, academic integrity, plagiarism, policies on reducing unoriginal writing, staff development programs for online faculty members, TurnItIn reports, similarity index rates

Introduction

TurnItIn is a company (www.TurnItIn.com) that offers plagiarism prevention tools and detection software to assist authors of academic work such as higher education learners and faculty members to ensure the academic integrity of submitted work. Academic work submitted to TurnItIn is compared to millions of published papers found in databases the company has access to and then the company prepares reports containing the similarity index rate to indicate how much of a paper contains unoriginal work.

At the research site, a policy on plagiarism is used to reduce unoriginal work and students' academic papers are submitted to TurnItIn by either the students or the faculty members. Each faculty member receives a TurnItIn report for each of his or her student's academic paper. Faculty members examine the similarity index rate, found in each TurnItIn report of each student's paper, to detect unoriginal writing. When the faculty members detect plagiarism then the academic integrity policy is used.

The research problem was the lack of research-based findings on the implementation of TurnItIn in online classes in order to reduce unoriginal writing of online graduate and postgraduate students (i.e., the similarity index rate is found in each TurnItIn report of each student's assignment submitted to www.TurnItIn.com). The purpose of this research at the research site was to examine the impact of the implementation of TurnItIn on reducing unoriginal writing. Archived data were collected from the research site that included similarity index rates of academic work submitted by online graduate and postgraduate students from an accredited online university in the United States of America. The findings revealed that the implementation of TurnItIn reports in online classes reduced unoriginal writing in graduate and postgraduate online classes. Education stakeholders may use these findings to improve academic integrity by using TurnItIn reports.

Research Problem

The research site has developed a policy on plagiarism, which expects faculty members to have students submit their academic papers to TurnItIn via each course shell with a link to the TurnItIn website (www.TurnItIn.com). TurnItIn reports must be submitted to faculty members together with student academic papers for grading in order for professors to examine the percent of originality and unoriginality. This policy was implemented to minimize student plagiarism. A copy of the policy is found in the faculty and student handbooks. The policy is clearly communicated to students and faculty members.

The research problem was the lack of research-based findings on the implementation of TurnItIn reports in online classes of graduate and postgraduate students to reduce unoriginal writing. No research has been conducted at the research site to provide stakeholders with research-based findings on the usage of TurnItIn reports. Specifically, no scholars have examined the similarity index percentages reported by TurnItIn in terms of the usage of internet resources, peer-reviewed articles, published dissertations, and so forth. Thus, the impact of TurnItIn on reducing plagiarism was examined as measured by the similarity index percentages. The researchers examined whether or not the program had an impact on students' similarity index percentages because the findings could assist the research site stakeholders in reducing unoriginal student work and in offering high quality staff development opportunities for faculty members and support for students with materials on academic integrity.

Nature of the Study

The participating online higher education institution has implemented a grading policy, which includes a requirement for every assignment to be submitted to TurnItIn, which is a company that uses a database of documents to ensure original academic work by checking submitted papers against 14 billion web pages, 150 million student papers and leading library databases and publications. The online institution at the research site uses TurnItIn to reduce unoriginal writing.

The university considers academic honesty to be essential for each student's intellectual development. The university emphasizes in the student handbook that students accept the responsibility for academic honesty and as a result a student who enrolls at the university thereby agrees to respect and acknowledge the research and ideas of others in his or her work and to abide by those regulations governing work stipulated by the academic program.

To help students derive the full benefit of the educational opportunity provided by the university, the university has defined a violation of academic honesty as any action or attempted action that may result in creating an unfair academic advantage for the student or an unfair academic advantage or disadvantage for any other member or members of the academic community. The university has defined plagiarism as use of intellectual material produced by another person without acknowledging its source. Examples of plagiarism include (a) copying of passages from works of others into an assignment, paper, discussion posting, or thesis or dissertation without acknowledgment; (b) using the views, opinions, or insights of another author without acknowledgment; and (c) paraphrasing another author's characteristic or original phraseology, metaphor, or other literary device without acknowledgment. The university expects faculty members to monitor students' work for evidence of plagiarism by reviewing TurnItIn reports of academic papers submitted to TurnItIn. The university conducts quarterly reviews of randomly selected samples of current student work for evidence of plagiarism.

The implementation of TurnItIn reports, containing similarity index percentages, was decided by the administrators of an online institution in the United States of America for all classes. This program was implemented to help students with academic integrity and was neither a one-on-one mentoring program for reducing unoriginal academic work nor a program based on a specific professional development model of university intervention program. Specifically, this program was implemented to assist students in submitting original academic work to the online institution as measured by similarity index percentages found in the TurnItIn reports when an academic paper is submitted to www.TurnItIn.com by the faculty members teaching online courses.

The emphasis of this program was on academic integrity for faculty members to detect plagiarism in academic work submitted by online students in order to help students increase their original work. At the research site, faculty members received training on how to utilize TurnItIn reports based on a university-wide needs assessment. Faculty members received teaching materials and resources including links to features of the TurnItIn report. This study involved the collection and analysis of archived quantitative data (i.e., collection of archived similarity index percentages) resulting in statistical data and tests to verify explanations.

The participants in this study were two cohorts of online graduate and postgraduate students. The cohorts were selected without random assignment. The first cohort consisted of students before the implementation of the program where the students were not required to submit their papers to TurnItIn. The second cohort consisted of students after the implementation of the program where the students were required to submit their papers to TurnItIn. For the first cohort of students, their academic papers were submitted to TurnItIn by the faculty members who after grading a paper decided to utilize TurnItIn and the similarity index percentages were received by the faculty members in the online course shells. For the second cohort of students, their academic papers were submitted to TurnItIn by the students and the similarity index percentages were received by their faculty members in the online course shells. The differences in the means between the similarity index percentages of the first cohort and the similarity index percentages of the second cohort were analyzed. Archived similarity index percentages were entered into SPSS 19.0 for the two cohorts of online students before and after the implementation of the program. An independent *t* test was used to measure the variance in the similarity index percentages between the two cohorts to provide statistical evidence of the treatment effect.

Purpose of the Study

The purpose of this quantitative research was to provide stakeholders at the research site with research-based findings on the impact of the implementation of the TurnItIn policy on reducing unoriginal writing in online class of graduate and postgraduate students. Using a *t* test, the researchers determined if there was a significant

difference in the means of the similarity index percentages, found the TurnItIn reports, of graduate and postgraduate academic papers before and after the implementation of TurnItIn policy in online classes to reduce unoriginal writing. The means of the archived similarity index percentages found in TurnItIn reports before and after the implementation of the program were compared to determine if there was a significant increase in the students' academic integrity as measured by the similarity index percentages provided by TurnItIn when an academic paper is submitted to detect plagiarism. Specifically, if there was a significant difference in similarity index percentages of students before and after the implementation of the program. The findings of this study might help university administrators, program developers, and researchers to design, implement, and evaluate staff development opportunities for faculty members and to provide support to online students to increase student proficiency in producing original academic work.

Theoretical framework

This study was grounded in the social learning theory of Vygotsky (1978). Based on Vygotsky's theory, when students are engaged in activities that reduce unoriginal writing within a supportive online learning environment then unoriginal writing may be reduced (Kearsley, 1994). Actively engaged students in preventing plagiarism via TurnItIn can enhance their responsibility for academic honesty and respect and acknowledgement of research and ideas of others in their academic work. The successful implementation of the TurnItIn policy might have had an effect on reducing unoriginal writing of graduate and postgraduate students. The TurnItIn policy as an intervention program supported the premise that intervention could cause a reduction in overall student academic integrity (i.e., reduction in unoriginal writing). Students could benefit from the program in terms of receiving feedback from TurnItIn and feel more positive and confident of their original writing skills. Resource materials were provided to all faculty members and students at the research site. The online university administrators provided support to faculty members about TurnInIt features by providing workshops to faculty members and by posting materials about

plagiarism and TurnItIn reports in each online course to help faculty members to improve instructional practices in order to help students improve their original writing skills.

Definitions of Terms

Academic honesty: Academic honesty refers to students accepting their responsibility for respecting and acknowledging the research and ideas of others in his or her work.

Similarity Index Rate: TurnItIn offers plagiarism prevention tools and detection software to ensure the academic integrity of academic work, which is compared to millions of published papers found in databases the company has access to and then the company prepares reports containing the similarity index rate, which indicate how much of a paper contains unoriginal work.

Plagiarism: Plagiarism is the use of intellectual materials produced by scholars without acknowledging the academic work. Examples of plagiarism include (a) copying of passages from works of others into an assignment, paper, discussion posting, or thesis or dissertation without acknowledgment; (b) using the views, opinions, or insights of another author without acknowledgment; and (c) paraphrasing another author's characteristic or original phraseology, metaphor, or other literary device without acknowledgment.

Assumptions, Limitations, Scope, and Delimitations

The study was conducted at an accredited online university, which implemented the TurnItIn policy. The study was bounded by one institution at the research site.

For the sample of this study, two cohorts of students were selected without random assignment and were homogenous samples comprised of students who attended online classes before and after the implementation of the TurnItIn policy. The two cohorts of students were unrelated samples or different students. For the purpose of this study, archived data were collected from both cohorts. Specifically, students' similarity index percentages were collected from TurnItIn reports found in the course shells of the selected courses for this study.

The scope was delimited to the specific sample at the research site, which consisted of online students whose papers were submitted to TurnItIn by faculty members before the implementation of the policy at the research site and by either by students or faculty members after the implementation of the policy. The limitations included that the findings of the study might not be applicable to online students and faculty members at other higher learning institutions. Accessibility to the TurnItIn by faculty members at the research site was applicable to the participating university's academic needs. The researchers assumed that the similarity index percentages provided by TurnItIn were reliable and valid and an accurate tool for detecting plagiarism. The researchers also assumed that the TurnItIn policy implemented at the research site was in line with the vision and mission of the institution.

Research Question and Hypotheses

The research question that guided this study was: What is the impact of TurnItIn policy on reducing unoriginal writing in online classes?

H0: There is no significant difference in the mean similarity index percentages between graduate and postgraduate classes before and after the implementation of the TurnItIn intervention program.

H1: There is a significant difference in the mean similarity index percentages between graduate and postgraduate classes before and after the implementation of the TurnItIn intervention program.

Setting and Sample

The participating online higher education institution has implemented a grading policy, which includes a requirement for every assignment to be submitted to TurnItIn, which is a company that uses a database of documents to ensure original academic work by checking submitted papers against 14 billion web pages, 150 million student papers and leading library databases and publications. The online institution at the research site uses TurnItIn to reduce unoriginal writing.

The university considers academic honesty to be essential for each student's intellectual development. The university emphasizes in the student handbook that students accept the responsibility for academic honesty and as a result a student who enrolls at the university thereby

agrees to respect and acknowledge the research and ideas of others in his or her work and to abide by those regulations governing work stipulated by the academic program.

To help students derive the full benefit of the educational opportunity provided by the university, the university has defined a violation of academic honesty as any action or attempted action that may result in creating an unfair academic advantage for the student or an unfair academic advantage or disadvantage for any other member or members of the academic community. The university has defined plagiarism as use of intellectual material produced by another person without acknowledging its source. Examples of plagiarism include (a) copying of passages from works of others into an assignment, paper, discussion posting, or thesis or dissertation without acknowledgment; (b) using the views, opinions, or insights of another author without acknowledgment; and (c) paraphrasing another author's characteristic or original phraseology, metaphor, or other literary device without acknowledgment. The university expects faculty members to monitor students' work for evidence of plagiarism by reviewing TurnItIn reports of academic papers submitted to TurnItIn. The university conducts quarterly reviews of randomly selected samples of current student work for evidence of plagiarism.

The study site administrators decided to implement the TurnItIn intervention program based on a needs assessment and detected plagiarism issues. After the implementation of the intervention program, the study site administrators continued to provide academic integrity resources to faculty members to support students and reduce unoriginal writing. The study site administrators supported the implementation of the reading intervention program by encouraging faculty members and students to work together to reduce unoriginal writing.

Literature Review

This body of research builds upon current studies suggesting that TurnItIn can be used as tool to help students identify integrity issues (Davis, 2008; Sutherland-Smith, & Carr, 2005) and research the writing process. There are several schools of thoughts relating to the use of Turnitin: (a) anti-plagiarism, (b) writing tutorial, and (c) academic

collegiality. Specifically, with regard to using TurnItIn as a means of deterring plagiarism, Kucecka (2008) stated that while TurnItIn can deter the copy and paste method so many students use when writing research, TurnItIn can also report misleading similarity index rates. This thinking concurs with Sutherland-Smith and Carr (2005) who also stated that while TurnItIn may suggest plagiarism, the ultimate decision to act upon the violation is that of the faculty member. Some faculty members may take into consideration as those students with an ELL background or those who are returning to school after many years (or decades) of being out of the classroom. Davis (2008) examined the opportunities for both instructors and students to learn as a type of formative assessment. The second school of thought is best seen by Parry (2011) who stated how TurnItIn has deterred plagiarism and is now ushering in a new method of teaching students how to track their own use –or lack thereof—of citations and research material. The final school of thought in regards to the use of TurnItIn is from Jones and Moore (2010) who reported discussions among faculty members and need to take place on those student papers generating 0% or as much as 30% or 50% + similarity index rate.

Leadership includes all stakeholders in a school (Zepeda, 2008) and is a collective action of the learning community to build shared purpose (Crowther, Ferguson, & Hann, 2009) to reduce unoriginal writing. Faculty members as leaders can help increase student learning (Hirsch & Killion, 2009) and the more they collaborate, the more leadership is shared (Fullan, 2006/2007).

In the online learning environment, faculty members should “engage issues of teaching and learning” (Supovitz, Sirinides, & May, 2010) and should “influence the behavior of students” (Crowther et al., 2009) to reduce unoriginal writing. The online institution’s leaders should help faculty members to “establish and achieve the goals and objectives of the school” (Cowan, 2006). Leaders should “actively engage change and contribute to student learning” (Murphy, 2005).

Successful shared leadership is about adapting practices and attitudes with students and with one another to be more effective (Donaldson, 2006). Saunders, Goldenberg, and Gallimore (2009) asserted that roles and responsibilities were important to effective

leadership teams. Material resources contribute to the success of the school (Hord, 2004, 2007).

Professional development will enable teachers to grow in the job (Wallis, 2008, p. 34) and to improve student learning (Viadero, 2005, 2007). Professional development requires focus on pedagogy (Guskey & SukYoon, 2009) and could help faculty members examine student work (Whitcomb, Borko, & Liston, 2009) via workshops (Reeves, 2010) and opportunities to learn from and with each other (Mangrum, 2010).

Scholars have found evidence that high quality staff development programs affect student achievement (Christie, 2009; Darling-Hammond & Richardson, 2009; Darling-Hammond, Bransford, LePage, & Hammerness; Desimone, 2009; Guskey, 2002; Leonard & Leonard, 2005). Faculty members need ongoing opportunities to apply learning to the classroom (Chappuis, Chappuis, & Stiggins, 2009; Diekelmann & Mendias, 2005).

Leaders of online universities need to meet the ever-increasing demand for technologically advanced learning opportunities (Taylor, 2006) and should embrace the challenges of extending online educational opportunities to learners (Calvert, 2005; Rhoda, 2005; Shea, Pickett, & Li, 2005). Twigg (2005) and Paloff and Pratt (2007) and Sulaiman and Mohezar (2006) have indicated that learner success in the online classroom may depend most on the competency of mentors.

An valuable asset of any institution of higher learning is the faculty members (Schuster & Finkelstein, 2006). Lack of academic preparation has negatively impacted students' success rates in college (Steinberg & Almeida, 2008). Student accountability is an aspect of a quality education (Fisher & Frey, 2008). Peer collaboration has been shown to raise achievement among students (Tribe & Kostka, 2007).

Scholars have supported the idea that technological competence is a good predictor of performance in the online environment (Barkley, 2006). According to Larreamendy-Joerns and Leinhardt (2006), educational technologies may help in improving students' academic achievement (Hornik, 2007). Technology-based education is emerging as an increasingly visible feature of education (Kern, 2010). According to Holstead, Spradlin, and Plucker (2009), training is needed to match future education needs.

Effective educators use professional development knowledge to provide high quality instruction (Killion, 2008) and understand the developmental changes of learners (Supovitz & Christman, 2005). Educators need to work together (Bouck, 2007) and be willing to work together (Murawski & Dieker, 2008).

Population and Sample

For the purpose of this study, an online university that has implemented a grading policy, which includes a requirement for every assignment to be submitted to TurnItIn was selected. The participating online institution at the research site uses TurnItIn to reduce unoriginal writing by expecting faculty members to monitor students' work to detect plagiarism by reviewing TurnItIn reports of academic papers submitted to TurnItIn. The university conducts quarterly reviews of randomly selected samples of current student work for evidence of plagiarism.

The student population of this study was online graduate and postgraduate students registered in an accredited online university. From the student population at the research site, the sample consisted of two cohorts where the first cohort consisted of students who took online courses before the implementation of the TurnItIn program and the second cohort consisted of students who took online courses after the implementation of the TurnItIn program. Both faculty members and students received instruction in TurnItIn before and after the implementation of the TurnItIn program. Specifically, students of the first cohort received instruction in TurnItIn before the implementation of the TurnItIn program while the students of the second cohort received instruction in TurnItIn after the implementation of the TurnItIn program.

In order to examine whether or not the TurnItIn program had an effect on students' similarity index percentages, the selection criteria of the participants had to be met to measure the variance in the similarity index percentages between the two cohorts before and after the implementation of the TurnItIn program. The participants were selected based on these criteria: (a) each student was a full-time online student; (b) the faculty members of the students of the first cohort had submitted

student's academic papers to TurnItIn (i.e., before the implementation of the TurnItIn program); (c) the faculty members of the students of the second cohort had submitted student's academic papers to TurnItIn (i.e., after the implementation of the TurnItIn program), and (d) each online course had a link to www.TurnItIn.com for faculty members to submit students' academic papers. Each course shell contained reports from TurnItIn containing the similarity index percentage for each academic paper.

Treatment and Control Groups

The first cohort took online courses before the implementation of the TurnItIn program. The second cohort took online courses after the implementation of the TurnItIn program. The two cohorts of students were unrelated samples or different students. The first cohort was taught by the same faculty members who taught the second cohort; however, the faculty members focused on implementing the TurnItIn program as set forth by the participating online university to ensure that online students maintain academic integrity as measured by similarity index percentages reported by TurnItIn. The second cohort of students was provided with student handbooks emphasizing the university's policy on academic integrity and the use of TurnItIn.

Instrumentation and Materials

Similarity index percentages are provided by TurnItIn as an assessment of students' original writing. For both cohorts of students, their academic papers were submitted to TurnItIn and the similarity index percentages were received by their faculty members in the online course shells. The similarity index percentages of both cohorts were collected by the administrator responsible for research at the research site. One set of data consisted of similarity index percentages of the control group. The other data set consisted of similarity index percentages of the experimental group. The administrator responsible for research at the research site collected these archived similarity index percentages for the purpose of this study and saved both sets of data into an Excel document. Each set of data contained no names of

students or faculty or course code/name. The archived data received from the participating institution will be kept in a locked and secure file cabinet on a jump drive, which is password protected, in the researcher's home for at least 5 years. The similarity index percentages were the collected data that represented the students' numeric scores assigned by TurnItIn before and after the implementation of the TurnItIn program. The differences in the means between the similarity index percentages of the first cohort and the similarity index percentages of the second cohort were analyzed.

Reliability and Validity of the similarity Index Percentages

The participating online higher education institution has implemented a grading policy, which includes a requirement for every assignment to be submitted to TurnItIn, which is a company, a global leader in addressing plagiarism and delivering rich feedback to clients. TurnItIn uses a database of documents to ensure original academic work by checking submitted papers against over 150 million archived student papers, over 90,000 journals, periodicals and books, over 14 billion of web pages crawled. TurnItIn has over 10,000 educational institutions as clients with over a one million of active instructors and over 20 million of licensed students in over 120 countries (www.TurnItIn.com). TurnItIn's OriginalityCheck helps instructors check students' work for improper citation or potential plagiarism by comparing it against the world's most accurate text comparison database (www.TurnItIn.com). TurnItIn shows the similarity index percentage, which indicates how much of the student's paper matches content from their databases so instructors can quickly understand how much of the paper is unoriginal (www.TurnItIn.com). TurnItIn is a plagiarism prevention tool and detection software that assists students and faculty members to ensure the academic integrity of submitted work. TurnItIn software checks academic work against all the published materials stored in database to see if the submitted academic work contains borrowed passages. Clients receive feedback from TurnItIn on submissions of academic papers that were compared against billions of Internet documents. The feedback contains the similarity index, which is based on the overall similarity of the submitted academic paper to documents in the databases of

TurnItIn. Feedback also contains a percentage-based breakdown of all sources that TurnItIn has identified in an academic paper. However, as TurnItIn admits, a reading that shows a high percentage *does not necessarily mean the paper has been plagiarized* (Turnitin, 2006). The results found in the TurnItIn report should be read as a prioritized list. The higher the percentage, the more frequently the source appears in the submitted academic paper, *whether cited appropriately or not* (Turnitin, 2006). The listed sources in the report are numbered and color coded so that they may be referenced with the submitted academic document in the *Paper Text* section where portions of the text have been color-coded and number-coded to match the sources found in TurnItIn's databases. The feedback report can help to identify specific instances of plagiarism, if, in fact, plagiarism exists in the submitted document. Faculty members, administrators, and students may examine the academic integrity of each one of these instances and should compare the submitted writing with the source material TurnItIn has identified. Stakeholders should examine the highlighted portion of academic papers for proper citations of primary and secondary sources, paraphrasing, originality, and referencing of materials cited in the academic paper. Researchers teamed up with a group of teachers, mathematicians, and computer scientists to form Plagiarism.org, which was the world's first Internet-based plagiarism prevention service and is now recognized by educators worldwide as TurnItIn (www.TurnItIn.com). The similarity index percentages are reliable in predicting issues with academic integrity and are consistent and stable over time.

Threats to Validity

Validity threats arise when researchers make incorrect inferences from the sample data to other persons, settings, and situations (Creswell, 2003). This researcher has had no control over the quantity and quality of the similarity index percentages of the TurnItIn program. The generalizations may not be applicable to other online students and faculty members in different contexts. The threat to validity was minimal as those who submit academic papers have no control over the similarity index percentages. Faculty members monitor the TurnItIn feedback. TurnItIn prepares the TurnItIn reports.

Measures for Ethical Protection

The administrator responsible for research at the research site collected the archived similarity index percentages for both cohorts and saved both sets of data into an Excel document. Each set of data contained no names of students or faculty or course code/name to ensure the confidentiality of information about the participants. The sample was online students whose identification information remained completely anonymous; therefore, the participants' rights were protected. Archived data collection was not affected by professional relationships between the researcher and stakeholders at the research site.

Role of Researcher

The researcher sought to examine whether or not TurnItIn support for students and faculty members had an impact on students' academic integrity as measured by the similarity index percentages. The researcher is a university researcher at the research site and was neither in a direct supervisory role nor an online faculty member of the participants. The role of the researcher was to gather empirical evidence to support this study.

Data Collection

For the purpose of this study, archived data were collected from the online courses where there is a link to TurnItIn assignments where faculty members submit students' academic papers and receive from www.TurnItIn.com reports. The reports are available to administrators, faculty members, and the student whose assignment has been submitted to TurnItIn. The similarity index percentages are provided by TurnItIn as an assessment of students' original writing. The similarity index percentages of both cohorts were collected by the administrator responsible for research at the research site. One set of data consisted of similarity index percentages of the control group. The other data set consisted of similarity index percentages of the experimental group. The administrator responsible for research at the research site collected these archived similarity index percentages for the purpose of this study and

saved both sets of data into an Excel document. Each set of data contained no names of students or faculty or course code/name.

The archived data were numeric where each similarity index rate was provided as a percentage between 0% and 100%. The academic level of the students was also numeric where '1' represented 'graduate' and '2' represented 'postgraduate.' No names of students, faculty members, and administrators were collected. All data were entered into SPSS 19.0 for data analysis. Similarity index rates were entered into SPSS for students who took online classes before the implementation of the TurnItIn intervention program in the academic year 2008-2009 giving the first cohort and for students who took online classes after the implementation of the TurnItIn intervention program in the academic year 2009-2010 giving the second cohort.

Data Analysis

Archived similarity index percentages were entered into SPSS 19.0 for the two cohorts of online students before and after the implementation of the program. An independent *t* test was used to measure the variance in the similarity index percentages between the two cohorts to provide statistical evidence of the treatment effect.

A *t* test was utilized to determine if there was a significant difference between the means of the two cohorts. The *t* test was performed at a confidence level at or above the 95% ($\alpha = .05$). The *t* distribution table was used to determine if the obtained *t* statistic was within or outside the critical region, indicating the result was statistically significant evidence of the treatment effect. No covariates and confounding variables were considered because the aim of this study was to determine the difference between two cohorts of students' similarity index rates.

The sample of graduate similarity index rates was $n = 111$. The similarity index rates of graduates during the academic year 2008-2009 was $M = 45.81$ with a standard deviation of $SD = 30.94$. The similarity index rates of graduates during the academic year 2009-2010 was $M = 14.37$ with a standard deviation of $SD = 12.14$. The mean difference was $M = 31.44$. The Pearson correlation was $\rho = .682^*$ ($p = 0.021$). The *t* value was $t = 16.978$ at $p = 0.03$ and $df = 110$. The findings indicate that the mean after the implementation of the program was reduced from

students' similarity index rates of 45% to students' similarity index rates of 14.37%. The mean similarity index rates of the experimental group were lower than the mean similarity index rates of the control group. Based on the t test for the similarity index rates, the t statistic exceeded the critical values, indicating that this result was considered statistically significant. The null hypothesis was rejected and the alternative hypothesis was accepted. A significant difference was found in the mean similarity index rates of graduate students before and after the implementation of the TurnItIn intervention program.

The sample of postgraduate similarity index rates was $n = 107$. The similarity index rates of graduates during the academic year 2008-2009 was $M = 27.21$ with a standard deviation of $SD = 14.94$. The similarity index rates of postgraduates during the academic year 2009-2010 was $M = 10.47$ with a standard deviation of $SD = 7.41$. The mean difference was $M = 16.74$. The Pearson correlation was $\rho = .416^*$ ($p = 0.04$). The t value was $t = 15.375$ at $p = 0.04$ and $df = 106$. The findings indicate that the mean after the implementation of the program was reduced from students' similarity index rates of 27.3% to students' similarity index rates of 10.47%. The mean similarity index rates of the experimental group were lower than the mean similarity index rates of the control group. Based on the t test for the similarity index rates, the t statistic exceeded the critical values, indicating that this result was considered statistically significant. The null hypothesis was rejected and the alternative hypothesis was accepted. A significant difference was found in the mean similarity index rates of postgraduate students before and after the implementation of the TurnItIn intervention program.

In conclusion, students' similarity index percentages of the experimental group were statistically different than students' similarity index percentages of the control group. The data analysis revealed that there was a difference between the combined students' similarity index percentages (i.e., 2008-2009 and 2009-2010 academic years) for the same participants. Thus, the TurnItIn intervention program has had a positive effect on the students' similarity index percentages at the research site.

Practical Applications of Findings

The findings should assist university online students to produce original academic work. Online faculty members should strive to successfully implement the TurnItIn program to help students to ensure student original writing. Online faculty members and students should apply knowledge gained from research on the successful implementation of the TurnItIn program. University administrators should support faculty members, staff, and policymakers to successfully use TurnItIn reports by creating a professional learning community to share ideas and knowledge about TurnItIn.

Significance of the Study

The findings of this study may potentially increase the knowledge of online faculty members and students about the TurnItIn features such as similarity index percentages to detect plagiarism. Online faculty members could help students to reduce unoriginal academic work through the use of TurnItIn. The findings may contribute to the research about the effects of the similarity index percentages of TurnItIn on academic integrity. Further research could be done using other features of TurnItIn such as (a) Internet sources, (b) publications, and (c) student papers.

The findings may be valuable to university senior leaders who are striving to reduce unoriginal academic work. Other online universities and scholars might use the findings of this study to make informed decisions regarding staff development opportunities for faculty members and support for online students. Institutes of online higher education and professional development providers might benefit from having statistical evidence that TurnItIn could increase student academic integrity. University administrators might use the findings of this study to support both students and faculty members with a continuum access to the TurnItIn program. The findings of this study are significant because the empirical evidence might assist the educational stakeholders at the research site in ensuring the success of online students in academic writing as measured by similarity index percentages reported by TurnItIn. Empirical evidence has been provided that the TurnItIn

program might maximize students' potential to increase academic integrity by reducing unoriginal work.

Implications of Findings

The findings of this study might have positive implications for change in terms of awareness of student proficiency in reducing unoriginal academic work. Online students' writing can benefit from improved usage of the features of the TurnItIn program. Online faculty members can benefit from using the features of the TurnItIn program by assuring student success to maintain academic integrity. Society might benefit from authentic academic work of online students who continue to contribute to academic integrity. As a result, faculty members, students, and society can collaborate on academic proficiency. Positive social change might also occur by providing faculty members with a structure through the TurnItIn program to help their students in having a more positive experience in academia and with more positive experiences in academia students may be more credible members of society.

The findings provided empirical evidence about the TurnItIn program and created new knowledge for university stakeholders with regard to the positive impact of the TurnItIn program on online students' academic integrity. The implementation of the TurnItIn program may provide not only graduate and postgraduate online students with positive experiences in ensuring academic integrity but also undergraduate students in improving their writing skills and reducing unoriginal work. Online students with more positive TurnItIn experiences may likely become productive members of society.

The findings of this study shed further light on TurnItIn practices to ensure academic integrity. University stakeholders should continue to receive support and professional development for the use of the TurnItIn program to help students produce original academic work.

The empirical evidence provided justification of human and capital resources for the use of and training on TurnItIn through high quality professional development programs such as the TurnItIn program. The empirical evidence supported the research site administrators' decision to implement the TurnItIn program and to

continue providing staff development opportunities to faculty members to ensure students' original writing. The TurnItIn program contributed to the research site's goal for students' increase of original work because when students become proficient in producing original academic work then society benefits. Thus, the TurnItIn program has the potential to help authors to ensure original writing, which is essential for them to become lifelong learners.

Recommendations for Action

University stakeholders at the research site should support online students, at all academic levels, to produce original academic work. University stakeholders at the research site should also support faculty members and staff with specific professional development on academic integrity.

At the research site, the policy on academic integrity should be evaluated for its effectiveness on student writing. Also, at the research site, the policy on professional development should be evaluated for its effectiveness on student writing to ensure that the intended goals of staff development are met.

Recommendations for Further Study

Scholars interested in replicating this study should collect data from more than one research site or online university or academic programs. Scholars may explore the long term effects of the TurnItIn program by tracking the similarity index percentages of the same group of students. Scholars should conduct qualitative studies to understand the perceptions of university stakeholders of the TurnItIn program.

Summary

Archived data containing the similarity index rates of TurnItIn reports were collected for two cohorts of 111 graduate and 107 postgraduate students before and after the implementation of TurnItIn reports in online classes. The findings revealed that the implementation of TurnItIn reduced unoriginal writing in graduate and postgraduate

online classes. A significant difference between the means of the two cohorts of similarity index rates of TurnItIn was found. The empirical evidence was that the implementation of TurnItIn has helped the online institution at the research site to reduce unoriginal writing. Education stakeholders may use these findings to improve academic integrity. The TurnItIn program has the potential to help authors to ensure original writing, which is essential for them to become lifelong learners.

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