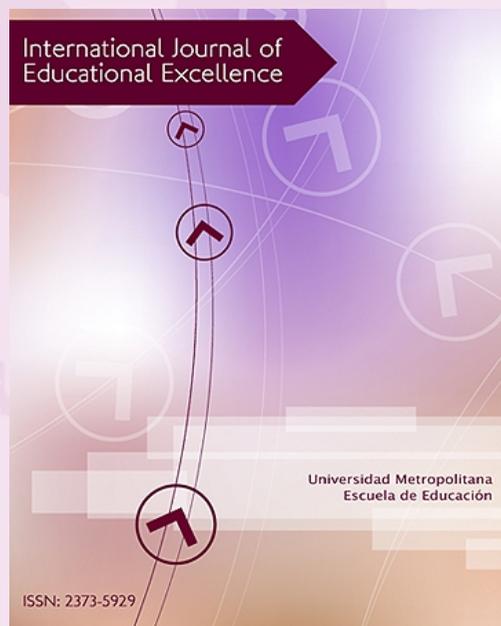


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Editor-in-Chief: José Gómez Galán

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Escuela de Educación, PO Box 21150 San Juan, PR 00928-1150

International Journal of Educational Excellence

DESCRIPTION

The *International Journal of Educational Excellence* (ISSN 2373-5929) is a multidisciplinary scientific journal which main objective is the dissemination of studies that provide answers to the main educational scientific and social problems present in higher education, in order to achieve excellence quality in all their areas. Papers will be welcomed, regardless of the subject area to which they belong as long as they entailed a contribution, innovation or breakthrough in the development of models of teaching or scientific research in the scientific world which lead to a social improvement. Research work performed in other educational levels may also be considered, if they demonstrate a strong and justified relationship to higher education. All papers submitted for publication must be unpublished and originals, and should not be under any evaluation procedure for publication in other journals. Theoretical work as well as work based on field studies and empirical laboratory experiments are accepted. All kinds of strategies and methodological approaches may have been used for the study. They have to comply within the parameters of current scientific and technological research. The review criteria and selection process will take into account mainly the quality of the work under consideration: if it makes a significant contribution to the object of interest, main interests of the journal and if it offers a breakthrough or significant contribution to the current scientific knowledge and, ultimately, if it contributes to the progress of our society. This journal is of free and direct access (Open Access, OA), and it serves the international scientific community and open knowledge.

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PEER REVIEW PROCESS

Original submissions to the *International Journal of Educational Excellence* (IJEE) will be reviewed by external referees, a process known as peer review. Reviewers are academics and researchers who are experts in the corresponding specialized field of knowledge. Their main task will be to study all submitted papers critically and constructively. For a paper's evaluation a "double-blind" system will be used. This method consists of one in which authors and reviewers are not known to each other, aiming at a maximum objectivity in the evaluation of the manuscript. Those articles that are considered by the editorial and scientific committee of the journal with high possibilities for publication will be submitted to referees who will determine the relevance of their acceptance. It may be the case that they be sent back to the authors with suggested changes and then back again to the journal to continue with the evaluation process, which ultimately will assess the relevance of the article to be published or rejected.

JOURNAL FREQUENCY

The periodicity of the *International Journal of Educational Excellence* will be two issues per year, and these will form a volume. The first issue is published in the first half of the year, the second issue in the second half. There is no deadline for the submission of manuscripts, which will remain open during the whole year and publication of the

article will possibly appear in the following issue after a positive evaluation of the work. For monographs, in which contributions to a specific topic will be requested, the deadline for receipt of manuscripts for evaluation corresponds to June 30 for the first issue and December 31 for the second issue, both referred to volume of the year following the call of articles.

IDENTIFICATION AND ACCESS TO THE JOURNAL

The journal is named *International Journal of Educational Excellence*, and it is abbreviated IJEE. Its ISSN (International Standard Serial Number) number is 2373-5929. For cataloging, it should be referred to as International Journal of Educational Excellence (IJEE): ISSN 2373-5929. Access to the journal may be performed from the main web address: http://www.suagm.edu/umet/oa_pe_edu_ijee.asp

AUDIENCE

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For all parties involved in the act of publishing (the author, the journal/publisher and the peer reviewer) it is necessary to agree upon standards of expected ethical behavior. The ethics statements for the International Journal of Educational Excellence (IJEE) are based on the Committee on Publication Ethics (COPE) Editors (www.publicationethics.org).

The value of scientific publishing relies on everyone involved behaving ethically. The publication of an article in the International Journal of Educational Excellence, a peer-reviewed journal, is a direct manifestation of the quality of work of the author and the institutions that support them. Peer-reviewed articles support and embody the scientific method. Ethics topics to consider: Authorship: Authorship should be limited to those who have made a significant contribution to the reported work. The authors should ensure that their study is original and written by them and their work has not been previously published and has been submitted only to the journal. / Originality: The authors should ensure that where material is taken from other sources (including their own published writing) the source is clearly cited and that where appropriate permission is obtained. / Data access: Authors may be asked to provide the raw data in connection with a manuscript for editorial review, and should be prepared to provide public access to such data. / Acknowledgement of sources: Proper acknowledgment. / Conflicts of interest: The authors should ensure that any real or apparent conflicting or competing interest is clearly stated on submission of their manuscript. / Reporting standards: Authors of reports of original research should present an accurate account of the work performed. / Human or animal subjects: The authors should ensure that they adhere to all research ethics. / Confidentiality and impartiality of the reviewers: The reviewers must maintain the confidentiality of the review process and conduct themselves fairly and impartially; immediately alert the editor-in-chief of any real or potential competing interest that could affect the impartiality of their reviewing and decline to review where appropriate.

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AUTHOR GUIDELINES

1. Introduction

The *International Journal of Educational Excellence* (IJEE) is open to all scientific articles which provide answers to the main educational and scientific problems currently impacting higher education with the purpose of achieving quality excellence in all areas. Papers will be welcome, regardless of the subject area to which they belong, as long as they entail a contribution, innovation or breakthrough in the development of models for teaching or scientific research within the university environment leading towards social improvement. Research work performed in other educational levels may be also taken into account, as well as they provide an adequate justification and a valid relationship with higher education issues.

All papers submitted for publication must be unpublished and original, and should not be under evaluation for publication in other journals. Theoretical work as well as those based on field studies and empirical laboratory experiments contributions, are accepted. All kinds of strategies and methodological approaches may be employed; however the selected method for each research has to be in compliance within the parameters of current scientific and technological research. The review criteria and selection process will mainly assessed the quality of the work under consideration in terms of the following criteria: significant contribution to the object of interest of the journal, a breakthrough to the current scientific knowledge and, ultimately, the contribution to the progress of our society.

2. Details for Submission

Manuscripts should be sent preferably sent in digital format. All manuscripts should be addressed to the journal Editor-in-Chief (email: jogomez@suagm.edu). Prior to submission, publishing standards should be carefully read at the following web site http://www.suagm.edu/umet/oa_pe_edu_ijee.asp. Only those articles that meet all the requirements and characteristics described at the web site will be accepted.

Submission of original digital file will preferably be in RTF format. The .ODF format is also accepted. Other formats (such as DOC, .PDF, etc.) are excluded.

In the rare event that the author (s) of an article cannot submit manuscripts electronically, the article shall be traditionally mailed. However, it should include a copy of the article in the previously outlined digital formats. Manuscripts will be sent by postal mail to the following address: International Journal of Educational Excellence (IJEE), Escuela de Educación, Universidad Metropolitana (UMET), PO Box 21150 San Juan, Puerto Rico, 00928-1150. The attention should be directed to: Editor in Chief.

3. Authorship and Responsibility

The author (s) of the article should submit one copy of the original article and a statement certifying that the work is original and has not been published before and that it has not been evaluated by another journal editorial committee.

The author (s) must also declare that [a] all named authors have materially participated in the development of the research or study that has led to the article, [b] any conflict(s) of interest, and [c] the sources of funding of research presented in the article or of the preparation of the research.

They shall also explicitly accept the journal rules of publication and the decision regarding the publication or rejection of an article. The *International Journal of Educational Excellence* (IJEE) assesses and requires all high international standards of ethical conduct of research and journal publication.

4. Preparation of Manuscripts

Articles should be submitted in proper English (British or American, however, but a mixture of both will not be allowed), whose length will be at least 3500 words and a maximum of 12,000, including references, notes, tables and figures. Exceeding this amount of words will be a major negative factor in evaluating the article, although articles exceeding this extension can be exceptionally published if they are properly justified and the work stands out for its quality.

The article must be preceded by an abstract thereof with a minimum of 150 and a maximum of 300 words. It must also be submitted in English language along with Spanish and Portuguese translated versions. The summary should also include five to seven key words in English, Spanish and Portuguese.

Articles of theoretical nature as well as those based on field studies will be accepted, and they will be considered as a positive evaluation element if those articles maintain the classical structure in scientific research papers, consisting of separate sections and subsections (eg. Introduction, Objectives, Methodology, Analysis, Results, Discussion, Conclusions, Appendices and Annexes, etc.). However, freedom is offered to the authors to establish the most appropriate structure, depending on the nature and characteristics of their research (and is especially significant in the case of theoretical articles). What is required in all cases is that the division of the article be clearly defined and numbered by the structure 1 (with 1.1, if 1.1.1, 1.1.2, etc.), 2, 3, etc. Each title and subtitle of the sections and subsections should be clearly identified through the use of spaces.

Standards of quotation, including references, must be governed by the style of the APA (American Psychological Association), contained in the *Publication Manual of the American Psychological Association*. Please see the following examples which are explained within the next paragraph:

Citations to text:

Whenever there is a quote of the author or authors of a publication, it should appear in the text in parenthesis followed by the year -for example if a single author is cited (Smith, 2014), if the citation refers to two to five authors (Smith & Brown, 2011 / Smith, Brown & Torrero, 2009), or if there are more than six authors (Smith et al, 2014) - and the full reference will appear in the list of references at the end of the article. If two or more works are cited, they will appear in the same order in the reference list separated by a semicolon (James, 2001, Smith, 2014). If in the article two or more references by the same author published in the same year are cited, they should be differentiated by lowercase letters (a, b, c, d, etc.) added to the year; in the text quote, the corresponding lower case letter will be used in each specific reference (Smith, 2014a).

If the citation refers to a general idea of the work, or if it is a general reference to an article, book or full investigation, but is not literally quoting a portion of the reference, it is only necessary to refer to the author and year of publication, without specifying the page intervals.

If the citation is literally quoting a text from a specific work, the author, year of publication and the page intervals should be entered preceded by "p" for example, according to Smith (2014) "the university teachers with many teaching hours have difficulty in carrying out research work" (p. 379), / in his study he argued that "university teachers with many teaching hours have difficulty in carrying out research work" (Smith, 2014, p. 379) but the author did not show the statistical analysis of the survey results.

In case the direct quotations exceed 40 words it is necessary to set up them within a separate text block, and quotation marks are omitted. It is recommended to begin the quotation on a new line with a tab on the left margin

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of ½ inch or 1.25 cm, maintaining this margin along the length of the cite. Page intervals should be indicated as described in the preceding paragraph.

Sometimes, in the work, it may be necessary to refer to indirect quotations, i.e. presenting information or ideas of an author who has been picked up and quoted by some other one. In this case, the two authors are cited; starting with the indirect reference, for example, Brown (cited by Smith, 2014, p. 179) suggests that research is essential in university teaching. It is also recommended to find out and cite the original source.

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The list of references should appear at end of the article. With this information, the reader may access any of the sources that have been cited in the main body of the work. Each and every one of the sources cited should appear in the reference list. Similarly, each of the references that appear in this list should appear in the main text of the article at some point.

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Author, A. A., & Author, B. B. (Year of publication). Title of chapter. In A. A. Editor & B. B. Editor (Eds.), *Title of book* (pp. pages of chapter). Location: Publisher

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At present, the rules of APA citation are widespread in the field of social research, and its style is the most currently used to cite sources in this area. Therefore in case of any doubt regarding citations, we recommend consulting the *Publication Manual of the American Psychological Association* (6th edition), where it multiple examples of formats of research papers, text citations, footnotes, references, etc. can be found; here we have offered only general guidelines.

General Format of Manuscripts:

The manuscript should follow the general format not only meeting the scientific requirements requested by this journal but also identifying the best possible characteristics of the article. Submission the manuscript in digital format, or RTF .odf, double-spaced in a standard size paper (8.5 "x 11") or A4 (21 x 29.7 cm) 1 "(or 2 cm) margins, is recommended. Although any easily readable source may be used, the use of Times New Roman 12 point is recommended. The manuscript should include a header at the beginning of the page, providing the main scientific information of the author and the work. These data are:

Title: should be as concise as possible, reporting the content of the article. It should be taken into account that quite often titles are used by scientific database systems and information retrieval, so it is advisable that it contain words directly related to the content of work. It must not contain abbreviations or acronyms that are not widely known. The title should be centered as the first element of the header. The APA recommends that it does not exceed 12 words in length, but if it were required by the nature of the work, it shall not prevent the acceptance of the manuscript.

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Mailing address of the corresponding author: In addition to email, full address for correspondence is recommended but not mandatory (telephone numbers, country and local codes). It may appear as a footnote.

Abstract: It should be placed after the name, affiliation and email address of the corresponding author separated by double space. As indicated above, it should have a length between 150 and 300 words. It will be sent in English, Spanish and Portuguese and should summarize the main features of the research work (as a minimum it is advisable to include a summary of the objectives, methodology and results, especially if it is based on fieldwork research). Future research may be included, especially if it has given rise to different questions that invite subsequent effort.

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Keywords: will be entered below the summary separated by a double space. We recommend providing five to seven key words that identify the work more precisely, and may help other researchers to find it in the international databases. The keywords will be sent in English, Spanish and Portuguese, and for their selection it is advisable to use the thesaurus most used in the specialty.

Article: Below the keywords, the author will placed the main body of the text submitted for publication in the International Journal of Educational Excellence (IJEE), in accordance with the recommendations given in this Guide for Authors.

Scientific and professional record of author (s): Placed below the main body of the manuscript leaving three lines and as the last element of the manuscript to be submitted. The scientific and professional background of each author should not be longer than 300 words, specifying recent published papers.

Notwithstanding the guidelines outlined above, it is strongly recommended for preparing manuscripts, to follow the APA style compiled in *Publication Manual of the American Psychological Association* (6th edition).

5. Publication of Articles

Submission of a manuscript to the *International Journal of Educational Excellence* (IJEE), implies a previous statement by the authors that the work submitted to the journal is original and unpublished, that it has been the result of the authors' work, that all the signatories have materially participated in its preparation, and that the manuscript is not under evaluation for publication elsewhere, whatever the media, especially that it is not under evaluation by other scientific journals. All journal rules are also accepted, as well as final the opinion resulting from the academic evaluation of Article whether it is accepted or rejected for publication.

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The decision to accept or reject the publication of the manuscript will be notified within a maximum period of four months. The notification will be sent electronically (e-mail) to the corresponding author. If accepted for publication, the paper will appear in the next volume of the journal.

The articles published in the *International Journal of Educational Excellence* (IJEE) are digitally edited and will retained all the characteristics of those published in traditional print journals. The articles appear in PDF format, conveniently typeset and numbered as classical journals. Therefore, in this sense the editors facilitate their distribution of the journal and articles and the scientific citation or its contents according to all current standards, making available to the scientific community, valuable contributions resulting from the research. We can say, that in general, this is a publication that takes advantage of all the benefits that ICT offers for easy editing and distribution, considering also the ecological side of publishing without paper. This means that only those parts that are needed should be printed if the case arises. In addition, the digital format of the articles of the *International Journal of Educational Excellence* (IJEE) is adapted to the new computer and telematics tools used in scientific and academic contexts, easily allowing information searching, online and bases data indexing, etc. Access to the content of the *International Journal of Educational Excellence* (IJEE) is free, thereby contributing to the globalization of science and culture.

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Academic Integrity: Influence on the Research Skills of the Pre-Service Teachers

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Abstract: Academic integrity plays a critical role for the achievement of the students. It is also a principle that students should uphold in dealing with every academic activity. However, some of the students fail to follow the standards yet; they still achieved and completed their academic work. This paper determined the level of academic integrity and research skills according to the perspectives of the pre-service teachers. This study employed descriptive correlational research design. The first part of the study focused on the self-evaluations of academic integrity of the pre-service teachers. The second part dealt with the self-report research skills. The researchers used modified and constructed questionnaires to gather the needed data. The findings of this study revealed that the pre-service teachers perceived that they exhibit a high level of academic integrity and a high level of research skills. The analysis further revealed that there is a significant relationship between the variables. Universities should foster within students to uphold academic integrity in writing research papers and other school requirements. It is highly significant to maintain standards in scientific and technical writing thereby universities should enhance mechanism and policies for academic honesty. There are no studies that relate academic integrity on research skills. Based on the result, the pre-service teachers need to engage in exercises to identify the literature gap analysis for them to be guided in analyzing the recent gaps of scholarly issues for their research to be appropriate and responsive to the needs of society.

Key-words: Academic Integrity, Research Skills, Pre-service Teachers' Teacher Training, Higher Education.

1. Introduction

Academic integrity is crucial for the achievement of the students. It is also a principle that students should uphold while engaging in every academic

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activity. However, some of the students fail to follow the standards set by the university.

Malpractices, such as cheating practices are one of the major problems for the administrators, institutions, and faculty (Maramark and Maline, 1993). Likewise, the same is true in a school community because it is prevalent among the students due to ignorance and confusions regarding what behaviors constitute dishonesty.

Okanović, Okanović, Mitrović, and Majstorovi (2013) conducted their recent study in Serbia, involving a large sample of students. They examined eight classes of attitudes towards school misbehavior which include attitudes towards exam cheating, truancy, falsifying school documents, rationalizing violence towards teachers, bribery and corruption, school nepotism and general attitudes towards misbehavior. The study reported that many students do not consider such behavior as an offense, but is a trend or even a recommended behavior.

It is already established that the term academic integrity is the standard for completing academic work (Grites and Rondeau, 2009) which build a set of values and skills that can influence the attitudes of the family, peer pressure, taught skills and modeling. With the purpose of attaining the academic integrity of the students, there is a need for them to follow ethical standards that should be integrated in the syllabus as part of the course requirements.

Research activity, as described by Griffith University (n. d) is the core activity in all universities which can increase the understanding and knowledge done by systematic investigation of issues, questions, phenomena or problems. The research skills of the graduates also involve generating and evaluating pertinent data and testing ideas, hypothesis, and theories.

In line with this, the pre-service teachers of the College of Education from Mindanao State University- General Santos City, Philippines should maintain being a catalyst of integrity while becoming a competent human resource. Regarding academic integrity in doing research, most pre-service teachers are able, and some are unable to do any form of malpractices for a reason that paraphrasing a context may result to confusions and vague statements, so they opt to change the synonyms of the words instead. They are aware of the consequences of doing any forms of malpractices, but they still tend to risk. Due to the stated realities, the researchers were prompted to undertake this research study.

2. Objectives of the study and framework

This study aimed to find out whether the self-evaluated academic integrity can influence the perceived research skills of the pre-service teachers of Mindanao State University, General Santos City during the academic year

of 2016-2017. Hopefully, the result of this study would be significant and would be a great help for the school head, teachers, parents, students, and research enthusiast.

The study of Fielden and Joyce (2008) discussed a multi-stakeholder and multi-level theoretical framework to analyze the selections of 125 published papers on academic integrity, all with Australasian authors. The respondents of their study had the same opinion with respect to the precise rules or guidelines required to produce a research output with integrity. However, in the papers reviewed if active or direct searching was the most unproductive searching technique (Bates, 2006), there was no consideration of the underlying factor. Additionally, Fielden and Joyce (2008) stated that there were inclusions on the teaching of the set of rules and guidelines. Therefore, all academic writers must know how to write correctly and would therefore not plagiarize or commit any academic dishonesty practice. Those who breaks the set of rules and guidelines will, therefore, be punished.

On the study of Kattenbraker (2007) where a total of six hundred six (606) research grantees and ninety- one (91) institutional representatives responded to the survey who reported a hierarchy of unethical research behaviors. This was cited from the study of Korenman, Berk, Wenger, and Lew (1998) and stated that the mean malfeasance or illegal rating was not related to the characteristics of the investigator performing the proposed act or its consequences. A malfeasance rating higher than 8.6 was due to fabrication, falsification, and plagiarism, and almost all thought they were unethical. A rating between seven and eight was received because of failure to give proper attribution or misleading statements about a paper. Others obtained a malfeasance rating between five and six because of sloppiness, conflicts of interest, oversights, and failure to share.

Conceptually, academic integrity refers to a relatively stable tendency to exhibit honest behavior during academic education (Okanović, Okanović, Mitrović, & Majstorović, 2013). As used in this study, this is the common standard of the University that fosters honesty in the scholastic studies/ researches by which all the pre-service teachers are expected to practice and uphold on the entire duration of their course. Hence, on this study, the pre-service teachers were asked of their self-evaluations on whether they engaged in specific dishonest behaviors. Whilst, research skill is defined as the systematic study of trend and scientific investigation of phenomena which includes careful collection, presentation, analysis and interpretation of qualitative data or facts that links an individual's speculation with reality (Ariola, 2006). In this study, research skills refer to the self-evaluation of the skills of pre-service teachers in writing their thesis as completion of the research requirements of the University from one to two-year research course undertaking. The conceptual framework is shown in Figure 1 below.

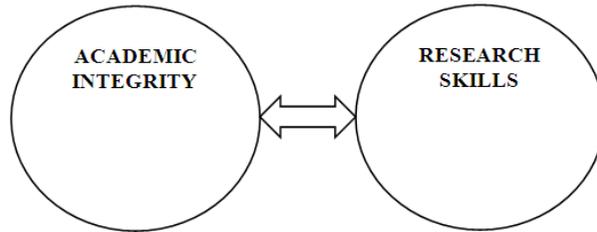


Figure 1. Conceptual Framework of the Study

The relationship between attitude and behaviour, according to later research, confirmed its existence and theories were developed which claims to account for the association. This commonly used concept was called as Theory of Reasoned Action (TRA) by Ajzen and Fishbein (1980), but eventually, this was later developed into the Theory of Planned Behavior (TPB). This theory asserts that cheating happens because a student already has the intention to engage to cheat in the first place. Hence, in doing research and thesis writing, students should equip themselves with different skills that will aid their knowledge, while upholding their academic integrity standards. In doing so, they will perform thesis writing without plagiarizing and fabricating information that is used, though there are opportunities that will exist. Moreover, the policies and rules imposed by the school and the faculty members are essential in following the academic integrity standard. There is a need to exert efforts to reduce the opportunity to cheat, perhaps strengthening vigilance during exams, using additional proctors and exam versions, increasing education on the value of integrity and honesty, and the like.

3. Methodology

3.1 Research Design

The study employed a descriptive-correlation design to determine if there was a significant relationship between the perceived academic integrity and research skills of the pre-service teachers of Mindanao State University, General Santos City. This study involved all one-hundred sixty (160) population of the third year Education pre-service teachers major in Bachelor in Elementary Education, and who were officially enrolled in Mindanao State University, General Santos City, Philippines. The researchers conducted this research during the academic year of 2016-2017. The instructors required these pre-service teachers to propose and defend action researches and term papers as part of their course requirements.

3.2 Instruments

The researcher used modified and constructed questionnaires based on the literature to determine the relationship of academic integrity and research

skills of the pre-service teachers. Three experts in their field of study were asked to validate the instruments. Thereafter, the instruments underwent pilot testing to secure the reliability of the questionnaires. The first part of the questionnaire dealt on the academic integrity of the students. This was modified from the McCabe Academic Integrity Survey Report (DuPree and Sattler, 2010). There was a modification of the academic integrity questionnaire due to the use of the pronouns “I” to make those complete statements. Likewise, the academic integrity questionnaire focused only on the specific behavior which was the last part of the original questionnaire since that covered already the need for focus of this study and this was also made to contextualize the instrument based on the local settings of the respondents. This had undergone validity which generated a total rating of 4.5 which yielded that the questionnaire was very highly valid as research experts rated it and had a Cronbach’s alpha index of reliability of 0.885.

The second part of the questionnaire was on the research skills of the students. It garnered a validity of 3.7 which meant that the questionnaire was highly valid. Based on the Cronbach’s alpha index of reliability, it generated a total rating of 0.976 which indicated that the questionnaire had excellent reliability.

After the conduct of the study, the data gathered were statistically analyzed using descriptive statistics and correlational statistics specifically weighted mean and Pearson r. The researchers tested the hypothesis at 0.05 level of significance. The researchers used weighted mean to determine the level of academic integrity and research skills of pre-service teachers. Moreover, they employed Pearson r to determine if there is a significant relationship between the academic integrity and research skills of the pre-service teachers.

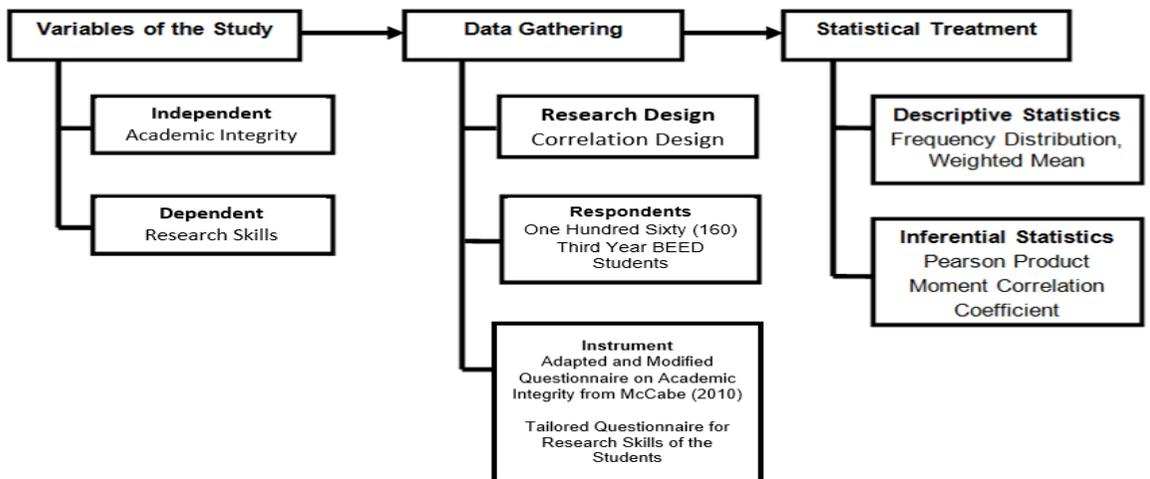


Figure 2. Research Design of the Study

4. Results and discussion

The following tables display the perceived academic integrity and research skills of pre-service teachers. Table 1 shows the extent of academic integrity of the pre-service teachers of Mindanao State University, General Santos City.

The pre-service teachers rarely use an electronic/digital device as an unauthorized aid during an exam (M=4.19) and digital technology such as text messaging to get unpermitted help from someone during a test or examination (M=4.18). It can be inferred that pre-service teachers may use their android phones to save documents, portable document formats, captured formula and even create a group chat but the result indicates a minimal resort to cheating using technology.

In 2005, McCabe surveyed college and university students. The results showed that there were 5% of undergraduates, 2% of graduate students and 11% of faculty who were engaged in the behavior. However, another result from a survey stated that thirty-five percent (35%) of students admitted using a cell phone to cheat.

Nonetheless, many students do not realize these behaviors are unethical because numerous students are involved in the culture of information that is free and always available on the Internet. For instance, a study showed that twenty-three percent (23%) of respondents did not think that storing notes on a cell phone was cheating, while, twenty-two percent (22%) said that texting friends during the examination is never a mistake (Common Sense Media, 2009).

Indicator	M	SD	Description
1. fabricate a bibliography.	3.91	1.002	Rarely true of me
2. work on an assignment with others when the instructor asked for individual work.	3.18	1.115	Sometimes true of me
3. work on an assignment with others via email or Instant Messaging when the instructor asked for individual work.	3.47	1.138	Rarely true of me
4. get questions or answers from someone who has already taken a test.	3.58	1.049	Rarely true of me
5. copy another student's program rather than writing my own in computer works.	3.99	.984	Rarely true of me
6. help someone else of my classmate cheat on a test.	3.81	.966	Rarely true of me
7. fabricate the results of the data.	4.06	1.071	Rarely true of me
8. fabricate research data.	3.93	1.100	Rarely true of me
9. copy from another student during a test or examination with his or her knowledge.	3.65	.946	Rarely true of me
10. copy from another student during a test or examination without him or her knowing it.	4.11	1.038	Rarely true of me
11. use digital technology such as text messaging to get unpermitted help from someone during a test or ex-	4.18	1.121	Rarely true of me

amination.			
12. receive unpermitted help on an assignment.	3.99	.955	Rarely true of me
13. copy (by hand or in person) another student's homework.	3.70	1.008	Rarely true of me
14. copy by using digital means such as Instant Messaging or email from another student's homework.	3.96	.961	Rarely true of me
15. paraphrase or copy a few sentences of material from a written source without footnoting or referencing it in a paper.	3.61	.891	Rarely true of me
16. submit a paper I obtained from a web site and claim it as my own work.	4.05	1.002	Rarely true of me
17. turn in a paper obtained in large part from a term paper website.	3.92	.938	Rarely true of me
18. paraphrase or copy few sentences of material from an electronic source - e.g., the internet - without citing it in a paper.	3.70	.889	Rarely true of me
19. use unpermitted crib notes or cheat sheets during a test.	4.14	1.021	Rarely true of me
20. use electronic crib notes stored in PDA, phone, or calculator to cheat on a test or exam.	4.09	1.045	Rarely true of me
21. use an electronic/digital device as an unauthorized aid during an exam.	4.19	1.090	Rarely true of me
22. copy material, almost word for word, from any written source and turning it in as my own work	4.11	1.013	Rarely true of me
23. turn in a paper copied, at least in part, from another student's paper, whether or not that student is currently taking the same course.	4.06	1.001	Rarely true of me
24. use a false or forged excuse to obtain an extension on a due date or delay writing an exam.	4.05	.996	Rarely true of me
25. cheat on a test in any other way.	3.82	1.027	Rarely true of me
Total Mean	3.89	.644	Rarely true of me

*1.00-1.80 (always true of me); 1.81-2.60 (Often true of me); 2.61-3.40 (sometimes true of me);
3.41-4.20 (rarely true of me); 4.21-5.00 (never true of me)

Table 1. Academic Integrity of Pre-Service Teachers

They also rarely use unpermitted crib notes or cheat sheets during a test (M=4.14). Using crib notes had been a tactic that students use to cheat yet using these during a test or examination was viewed as either not cheating or deliberate cheating (Balbuena & Lamela, 2015). There has been insufficient literature that address about situational and routine activities approach to rule breaking like how students actually plan, manage and execute the complex ways of importing the crib notes during the examination. They use it while avoiding the detection from proctors and perhaps a kind of confusion about the severity of using these during an exam or test. Also, they collaborate with peers because it has a clear advantage over solitary cheating. A student can distract the professor and another student has enough time and opportunity to get and place the crib notes in a strategic location without the fear of being caught or detection (Shon, 2006).

The pre-service teachers copy a test or examination from another student without the idea of the other person ($M=4.11$). James, Olatona, and Samuel (2015) asserted that the so-called “giraffing” is one of the most common methods that occur in any examination, which involves stretching of the student’s neck to copy from another student with or without the latter’s consent. Research also reported that out of nine hundred forty-three (943) students, there was thirteen percent (13%) who practiced this form of behavior. However, this form of behavior ranked twelve (12) out of twenty-one (21) common forms of behavior (Greasley, 2011). Likewise, in 2016, the study of Oko and Adie showed that 70% of the respondents agreed that copying others’ scripts through spying, also known as “giraffing,” was the most commonly used form of examination malpractice.

Overall, the pre-service teachers reported that they have a great extent of academic integrity which obtained a total mean of 3.89. It can be inferred that these pre-service teachers value academic integrity in their scholastic undertakings since two of the core values of the University includes integrity and excellence. These results support the findings of Jones (2011) during the Fall Semester on 2010 among forty-eight (48) students who were enrolled in an online business communication course. Regarding cheating, 41 percent of the students said they would never cheat, and 33 percent of the students said they would never plagiarize an assignment because of ethics. Likewise, 50 percent of the students from the students at the University of Central Florida thought the students did not cheat.

Considering that the general public commends students to pursue knowledge and report their discoveries truthfully, they expected that any misconduct or dishonesty destabilizes the stature of a university. Moreover, the fundamental purposes and processes of an academic community are deliberately interfered when academic authorities tolerate such actions. Incorporating the code of academic integrity, as the University of Vermont (2015) confirmed, “reaffirms the principle of student academic achievement coupled with personal responsibility and accountability for individual action and the consequences of that action.”

Moreover, Table 2 displays the perceived level of the research skills of pre-service teachers of Mindanao State University, General Santos City. The pre-service teachers often formulate the process in gathering the data with an ethical procedure ($M=4.08$). The pre-service teachers asked for the consent forms of the parents of the elementary learners and assent forms of the elementary learners themselves to secure ethics in their research process.

Likewise, prior to conducting their research studies in public elementary schools, they asked 3 to 5 technical experts to validate their questionnaires and after which pilot test their instruments to secure validity and reliability of the questionnaires. Most, Craddick, Crawford, Redican, Rhodes, Rukenbrod, & Laws, (2003) confirmed that regardless of its field of study or

preference for identifying the data, whether quantitative or qualitative, the accuracy of data collection is a priority to maintain the integrity of research because inappropriate data collection instruments will increase the likelihood of errors occurring.

Englander (2012) pointed out that it is essential to articulate methodologically the research process in ways that data collection and data analysis is part of a single unified procedure with the same underlying theory of science to achieve the same rigid quality as a scientific research document.

Additionally, the pre-service teachers often choose the exact locale of the study (M=4.03). Students choose the exact locale of the study since they have the knowledge of the area they are studying available for them. They conduct pre-surveys and interviews in their locale to verify that societal problems exist to make their studies relevant, appropriate and responsive to the needs of their society. They believed that the locale is vital in their research since they have to make decisions on what specific subject they will need to research and what location they will conduct their study in (Joynson, n. d). It is also focused on issues like sample selection, use of instruments, the expected comparison and many more (Bechhofer and Paterson, 2000).

Indicator	M	SD	Description
1. identify the literature gap of my study.	3.57	.936	Often
2. identify the general statement of my study.	3.70	.937	Often
3. formulate my introduction carefully to catch the reader's attention.	3.69	1.017	Often
4. formulate statement of the problem based on the title of my study.	3.83	1.047	Often
5. formulate the statement of the problem that will be investigated in my study.	3.85	1.004	Often
6. formulate the reasons and beneficiaries in conducting my research.	3.81	1.031	Often
7. state the scope and delimitation of my research and the topics that are supposed to be included and excluded in my study.	3.91	.996	Often
8. identify the reliable sources, facts and ideas that are needed to support my study.	3.85	1.035	Often
9. identify the unfamiliar key terms used in the study with brief but clear definitions.	3.83	1.029	Often
10. define the key terms operationally and conceptually.	3.83	1.043	Often
11. identify the research methodology that is applicable for my study.	3.88	1.078	Often
12. describe the respondents comprehensively to fit the purpose and provide the needed data of the study.	3.96	1.048	Often
13. solve the respondents of my study with exact numbers needed for my study.	3.94	1.048	Often
14. choose the exact locale of the study.	4.03	1.107	Often
15. state the reasons in the locale of the study why I need to conduct it in the specific place.	3.97	1.121	Often
16. select appropriately the instruments that are used to collect the needed data for my study.	3.99	1.028	Often
17. follow different steps on what to do in conducting my research.	4.02	1.049	Often

18. formulate the step by step procedure in gathering the data with ethical procedure.	4.08	1.040	Often
19. can determine the statistical method that I will use to treat the data gathered.	3.93	1.059	Often
Total Mean	3.88	.840	Often

*1.00-1.80(never); 1.81-2.60(rarely); 2.61-3.40(sometimes); 3.41-4.20(often); 4.21-5.00(always)

Table 2. Level of Research Skills of Pre-Service Teachers

The pre-service teachers often follow different steps on what to do in conducting their research (M=4.02). They are exposed to the research process prior to their proposal defense as part of the class exercises. Blankenship (2010) explained that “scientific process is a multiple-step process where the steps are interlinked with the other steps in the process”. To attain this, if students will make changes in one step of the process, they must go back to the previous procedures and review all the other steps to make sure that they follow properly the scientific ways throughout the process.

Likewise, the pre-service teachers can often identify the literature gap of the study (M=3.57). However, the pre-service teachers still need further training since they had difficulty in this skill as its mean showed the lowest compared to other means. Based on Akindele’s (n. d) study, out of the 20 graduate students, there were graduate students of whom 35 percent of Education, 40 percent of Humanities, and 52 percent of Social Sciences were unable to demonstrate the critical thinking and evaluation skills in their review of related literature. Their study did not show gaps that exist in previous studies.

Creswell (2012) pointed out that students should study the problem if their study fills a gap or void in the existing literature. In this way, their study fills a void by covering topics not addressed in the published literature.

Overall, the pre-service teachers reported that they have a high level of perceived research skills with a total mean of 3.88 result. This demonstrated that the pre-service teachers perceived that they have well-developed research skills due to numerous research requirements that they had undergone as part of the teacher education curriculum. This result is supported by the findings of Ismail and Meerah (2011) who evaluated the research competencies of doctoral students. Possessing the five components of their ability to conduct research, research capacity, reflection skills, problem-solving skills, communication skills, and research methodology skills, the research showed a high level which obtained a mean of 3.67 achievements. However, their skill on research methodology was at moderate level. Universiteit Leiden’s prospectus displayed that thesis writing seminar offers a platform to the students. This allows the students to present their thesis and discuss it with their fellow students and professors or the speakers. Moreover, the significant topics are discussed in the class. Some of these include defining the subject, formulating the research question and hypothesis, testing the theory and methodology,

seeking out reliable sources, building out bibliography, and structuring the thesis.

Further, Table 3 presents the relationship between perceived academic integrity and research skills of the pre-service teachers of Mindanao State University, General Santos City. The results showed that there is a low positive correlation between academic integrity and research skills of the pre-service teachers with the over-all result of $r=.212$ and p-value of $.007$. A p-value of less than 0.05 explains that only 5% of the variations attributes to the research skills of pre-service teachers. The other 95% of the variations in research skills is due to other variables. Based on the self-evaluation of the pre-service teachers, the result implies that the academic integrity of the pre-service teachers influences their research skills. The positive value of the correlation coefficient indicates that the greater the extent of academic integrity of pre-service teachers; the higher is their research skills.

Pre-Service Teachers				
Variables Correlated	r	r²	p-value	Remark
Academic Integrity and Research Skills of Pre-Service Teachers	.212	.045	.007	Significant

Table 3- Relationship between Academic Integrity and Research Skills as Perceived by

Since there are no literatures and studies conducted that show the relationship of this study, a relative article of Emerson, Rees, & MacKay (2005) highlighted in their study, entitled “Scaffolding Academic Integrity: Creating a Learning Context for Teaching Referencing Skills” that a student who acknowledged 24 percent of her secondary sources proved no plagiarism because she used too much quotations in the scientific report. Despite this, she showed competence in her acknowledgment of secondary sources. On the contrary, there were two students who had minor plagiarism problems because they only had 8 per cent of secondary source material. The study indicated that the plagiarism was unintentional and a misunderstanding of the misconduct. Nonetheless, the students should have indicated the proper use of paraphrasing and quoting secondary materials.

4. Conclusions

Based on the findings, the study concluded that the pre-service teachers of the College of Education perceived that they have a high level of academic integrity. They also perceived that they have a high level of research skills since they underwent research for two to three consecutive years during their study in the university. Therefore, this study confirmed that the academic integrity has an influence on the perceived research skills of the pre-service

teachers. However, it should be taken note that the pre-service teachers should work collaboratively or individually especially in doing assignments. They should also identify the literature gap analysis for them to be guided in analysing the recent gaps of scholarly issues. The result demonstrated that students need improvements in their research skills because the result of the study was mainly based on their self-evaluations and perceptions. Hence, there is a need to evaluate outcomes of their research knowledge and they need to undergo further research workshops and trainings.

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Psychopedagogical Predecessors of Connectivism as a New Paradigm of Learning

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Abstract: This article presents an historical overview of the main background theories of Connectivism, understood as a new paradigm of education. The object is to assess whether this new educational paradigm is an evolution from preceding schools or a revolutionary theory in the educational field. Psychoanalysis and the School of Gestalt are presented as the earliest antecedents, and the influence of Instructionism, Constructivism, Chaos Theory, Neuroscience, Network Theory and Theory of Complex Adaptive Systems will be analysed, as they are considered direct predecessors. The article concludes by reflecting the influences of several contemporary schools of educational theories such as the Theory of Conversation, the Actor-network theory, Network Learning, e-learning 2.0., Microlearning, Nano-learning, University 2.0., Curriculum 2.0., Pedagogy 2.0 and Navigationism. These schools complete the theoretical foundations on which Connectivism is based. As a consequence, Connectivism is only the evolution of previous schools and not a theoretical revolution in pedagogy. Its ideas represent the adaptation of previous theories to the current society, where social and communication technologies have changed the bases on which the knowledge and learning are based..

Key-words: Connectivism, Educational Paradigms, Social Network, New Technologies, e-Learning.

1. Introduction

The aim of this review is to present the theoretical bases of Connectivism as a new paradigm of education. This analysis is intended to

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understand the birth of Connectivism as a historical evolution of education. Connectivism is, therefore, the evolution of existing theories within the scientific field adapted to the current society and not a breakup with the previous works. (Verhagen, 2006, Kop and Hill, 2008).

Before going on, it is necessary to define the concept Connectivism and its meaning in the current scientific educational field. It is a complex task because Siemens, the founder of this psychopedagogical school, knew that the knowledge is too perishable and always tried to avoid definitions and close concepts (Siemens, 2004, 2006, 2013).

If we look into the contributions made by the main theorists of Connectivism, it is possible to identify a theoretical basis upon which several principles are settled, as well as an approach to understand it. The reference to “approach” instead of “knowledge theory” or “learning theory” is not a trivial act, because doing so, we elude most of the current criticisms to Connectivism, including those from Downes, one of the founders and main promoters of this theoretical approach in education. (Downes, 2008, 2012; Forster, 2007; Verhagen, 2006).

This connectivist approach implies to emphasise the pragmatic value of the connectivist statements. Connectivism is used to interpret and understand the processes related to learning and knowledge in the current world, particularly regarding the technological evolution of social networks and e-learning. Therefore, the principles of Connectivism should not be used to explain every kind of learning and knowledge as some gaps could be found in its principles. These gaps are covered by previous theories “complemented” by Connectivism in order to adapt them to the digital technological world. (Downes, 2008, 2013).

In its endeavour to understand knowledge and learning, Connectivism defines the human mind as a network which adapts to its environment. Therefore, learning could be defined as the process of creating networks by means of connections among several nodes and knowledge would be held in these networks. The role of the learner is both active and creative because they need to constantly adapt to the changing environment by making new connections, identifying patterns and learning through the decision making experience (Siemens 2006, 2013).

One of the main ideas in Connectivism is that knowledge is something unpredictable, unstable, uncontrollable and in continuous growth, which means that it goes beyond the total control of a person and might be in their external networks (communities, digital devices, etc.) constantly changing. Therefore, Connectivism is not only the idea of individual human knowledge and learning, but also an approach to understand the collective mentality of a network of individuals, a community or a society based on the same principle: the generation of network ecologies constantly changing and evolving.

It is easy to find similarities between the concepts of “human mind” and “knowledge” according to Connectivism and the Internet and the uprising and quick expansion of social networks such as Twitter or Facebook. This situation is understandable because they are human creations which base their success on the suitability to satisfy the human need of learning and developing networks in order to adapt to the environment and hence, to learn. There is where the key of Connectivism lies, because it is certainly the theoretical and psychopedagogical approach most prepared to describe and explain the current world in which social and digital environments are mixed, creating new ways of knowledge and learning which could not be explained by the previous educational theories, because knowledge in this current digital age is unpredictable, disorganized, horizontal, democratic and, overall, in constant and exponential expansion.

2. The Psychopedagogical predecessors of Connectivism

2.1 The early predecessors

The oldest precursor of Connectivism could be found in the psychotherapeutic practice of Psychoanalysis (Freud, 1900, 1953). Connectivism shares some curious similarities with this controversial psychological school, which allows us to do a slight parallelism between them. Both Psychoanalysis and Connectivism share the following features:

- Both schools were created by one only person: Freud (1899) and Siemens (2004), although both received later enriching contributions from different authors.
- Both theoretical schools were created with the aim of explaining some features of human behaviour that their contemporary scientific theories were unable to explain. Freud aimed to understand the human motivation, finding the idea of the “unconscious mind”. Siemens, in turn, tries to complete the gaps and inaccuracies caused by classical learning theories, especially regarding a fast and wide growth of knowledge, which he considers their main weakness (Siemens, 2006).
- Both schools have been strongly criticised as scientific theories, being more advisable to apply them as approaches: therapeutic in the case of Psychoanalysis and educational in the case of Connectivism.
- Both schools had a quick spread and triggered a lot of influence, in their field and in others spheres, gaining a great scientific interest in their time.
- Finally, the main similarity between them is the great importance given to the performance of the human mind as a network. On the

one hand, the Free Association of Ideas technique is key as a therapeutic method in Psychoanalysis (Freud and Breuer, 1895). On the other hand, Connectivism defines learning as the process of connecting information nodes or sources. Therefore, both schools consider a similar human mind performance when thinking or learning, in the form of a network and a generation of links between ideas.

Other early predecessors of Connectivism can be found in Gestalt psychology. Theorists of this school consider the learning process as a development of new ideas or as a modification of the existing ideas (Wertheimer and Riezler, 1944). For this purpose, the learner needs to have an active role, as learning is achieved in a deliberate way, by exploring our environment and circumstances and being creative. This idea is connected to that of Connectivism under which the learning network must be “modified and adjusted”. Siemens considers that the learner builds learning networks which adapt to their current needs and later modifies as their circumstances change (Siemens, 2013).

Similarly to the Gestalt Psychology, Connectivism also considers a global view of reality with a purely pragmatic goal. In both theoretical schools, knowledge is dependent on the global view generated by it. Therefore, knowledge is less important than the view upon which it lies and its meaning can change according to the circumstances. The learner creates their own reality using the elements (knowledge) they have; taking an active role and being creative is, therefore, a key factor to generate learning, which, furthermore, will be completely personal and unique compared to the learning of other learner.

Moreover, it is convenient to emphasize that some of the Gestalt main principles (similarity, proximity, continuation, etc.) are laws that show the way human mind make connections and associations. These laws are also used by Connectivism to show how a knowledge network is created and modified any moment and for any learner.

2.2. Predecessors in pedagogy and psychology sciences

The continuous development of knowledge in pedagogy and psychology has meant a huge source of references for Connectivism. Many authors of great relevance have been recognised as a source of inspiration for the contributions made by some of the most important connectivist authors (Siemens, Downes, etc). Authors like Bruner, Ausubel, Piaget, Bandura, Gagné, etc. and scientific schools like the Theory of Networks, Neuroscience, Instructionism or the Theory of the Chaos have built the basis for the main connectivists' axioms.

As per the traditional juxtaposition of Instructionism and Constructivism in education, Connectivism is undoubtedly much closer to Constructivism (Duffy and Jonassen, 2013). However, some of the ideas of Instructionism have been used as a reference. Considering Instructionism as “the expression of believing that the perfectionism of the instruction leads to a better learning (p.151)”, according to Papert’s definition (1995), it can be observed that Connectivism agrees with Instructionism when claiming that practice and improvement help the learner to achieve a deeper and complex knowledge. For Connectivism, however, this process is not based on the perfection of the instruction but in the improvement of the learner’s decision making based on the improvement of their knowledge network. The richness of this network leads to a more complex view and to a more focused deepening on the learner’s interests.

Regarding Constructivism, this school is defined as the third metaphor in learning according to Mayer (Mayer, 1992):

Learning as	Teaching	Instructional focus	Results
<i>Response acquisition</i>	Feedback provision	Centred in the syllabus (Right behaviour)	Quantitative (Strength of associations)
<i>Information acquisition</i>	Information provision	Centred in the syllabus (Right information)	Quantitative (Amount of information)
<i>Meanings construction</i>	Cognitive guide	Centred in the learner (Significant processing)	Qualitative (Knowledge structure)

Table 1. Three metaphors of learning. Source: Mayer, 1992, from Zapata-Ros, 2012

Within the constructivist view of meanings construction during the learning process, it is advisable to stand out several theoretical approaches from different authors which have also been fundamental for the connectivist theories.

The first constructivist theoretical approach presented as a predecessor of Connectivism is the School of Gestalt, led by Von Wertheimer and Köhler, which was previously mentioned at the early predecessors section herein.

The main promoter of Constructivism in education, Piaget, introduced the importance of interaction with the social environment in his Constructivist Theory of Learning. According to Piaget (1954), learning is constructed through the learner’s maturity and experience in relation with their physical and social environment and thanks to this, the mental structures are modified and extended into more complex ones.

Gagné (1971) is another author who was inspiring for the creation of Connectivism. He claimed there are internal and external determining factors that regulate the learning process, agreeing consequently with the connectivist idea of ecology and adaptation to the social environment. The internal determining factors work as a storehouse for the acquisition of abilities that are a prior requirement to learn; the external determining factors are related to the context that makes the learning process easier.

Another of the most relevant authors in Constructivism, Bruner (1966), presented the concept of Discovery Learning, which means to accept the idea of incidental learning and the appearance of challenges for the learner that might modify their interests and their way to solve problems. Siemens (2004) developed this idea as the complete definition of a problem through the combination of the different points of view of the agents involved by means of their individual creativity, being able to reach a deeper view of the problem through the casual combination of their own interests.

Bruner (2001), in turn, considered the active dialogue learner-teacher as a key factor in learning, which implies the creation of an external learning network that generates knowledge, as the connectivist ideas assert.

Vygotsky has also been a strong inspiration for Connectivism. Vygotsky (1978) presents the idea of competence and considers the social factors as external triggers for learning, working as an external knowledge network; however, its bigger influence in Connectivism is the idea of Zone of Proximal Development, defined as:

"The distance between the actual developmental level of the child as determined by their independent problem solving and the highest level of potential development as determined by the problem solving under adult guidance or in collaboration with their more capable peers" (Vygotsky, 1932, mentioned in Wertsch, 1988; p.84)

This idea of the "Zone of Proximal Development" links directly with the performance of a knowledge network according to Connectivism and coincides with the following connectivist principle: "The ability to increase knowledge is more important than what we already know" (Siemens, 2006; p. 31).

Finally, Ausubel (1964) conceives knowledge as an assignment of meaning process. New knowledge has to be linked to old knowledge, transforming it consequently and thus creating a deeper and more complex knowledge. Through this process, the learner also achieves the ability to adapt to new situations, because they gain a more solid knowledge where the most basic knowledge holds the most complex one, under a hierarchical structure similar to the connectivist "network".

The constructivist metaphor of learning as a Construction of Meaning entailed Cognitivism naturally evolving towards a syllabus more centred in the learner. From this perspective, learners have an active and main role in their own learning process, as they are who construct and organise their own learning through the construction of meaning into the knowledge they are acquiring.

The constructivist perspective of Cognitivism has been predominant from the '80s until now in the educational scientific field. At present, this perspective represents multiple changes in the educational configuration of learning in schools, serving as a reference to new educational methodologies that are being currently introduced, such as Project-based Learning, learning corners, etc. (Cathalifaud, 2014).

Connectivism agrees with Constructivism in a big part of this global view of the learner, as Connectivism also considers that the learner has a main role in the learning process and gives them an active role when choosing contents and organising them according to a unique and own meaning. However, both theories differ in a fundamental aspect, as Connectivism rejects the idea of meanings being constantly constructed.

According to Connectivism, the learner is not constantly constructing because it means an attempt to organise the chaos of the learner's achievable knowledge. Sometimes, the learner just surf through this chaos without the need of organise it, or even disorganising what was previously organised. Therefore, as Siemens claims: "We are not always constructing (which implies a cognitive work), but we are constantly making connections" (Siemens, 2006, p.27).

This critique from Connectivism to Constructivism leads us to another psycho-pedagogical predecessor of Connectivism: the Chaos Theory applied to Education. According to the Chaos Theory, any social issue is unfinished and is based on distorting and chaotic events that create disorder from the order and vice versa. That is why education, as a social science, should be based on this perspective (Castells, 1999). Moreover, in a cognitive level, creativity is considered the chaotic engine of the intelligence (Colom, 2005). Creativity opens the doors to the disorder generated by the acquired knowledge in the learner and drives it to new and complex heights that can be organised in a higher level and so on indefinitely.

It is easy to see the connection between Connectivism and these Chaos Theory principles. Connectivism, similarly to Chaos Theory, does not consider that learning is guided, creates a cognitive order and is intentional. They also agree in the idea of knowledge being constantly fluctuating, meaning that current knowledge is perishable and becomes the ground of new knowledge. However, the scope of the Chaos Theory to define the learning acquisition of the learner is more limited, as this theory does not consider that the connexion nodes are points of support to define each learner's learning so there would

not be any basis to hold the decision-making process. According to the Chaos Theory there is not a clear structure to guide the learner and, therefore, all learners might be similar or similarly different. In Connectivism, the before mentioned knowledge network made of nodes structures learning and knowledge and also is the basis, in a non-deterministic way, for future learning processes with a personality which is not only fluctuant but also particular and personal. This personality is not determined by the Chaos Theory.

Current scientific advances in Neuroscience have also meant a strong support for connectivist theories. Discoveries in cognitive neuroscience related to the operation of mirror neurons, discovered by Rizzolatti et. al. (1996) confirm the connectivist idea of knowledge being able to become a reality in the human mind without the intervention of symbolic aspects and therefore, without the constant creation of meanings.

Initially, mirror neurons were thought to be executors of imitation features in the human being, but it has been discovered that they can go much further. According to numerous studies, this neuronal system, mainly present in the frontal parietal area of the cerebral cortex, makes it possible for the human being to feel the feelings, emotions and even actions perceived in others as their own. These findings suggest that multiple systems in humans might be fitted with neuronal mechanisms of reflex, both for the integration and differentiation of perceptive and motor aspects of the actions performed by ourselves and also by others (Mukamel, Ekstrom, Kaplan, Iacoboni and Fried, 2010). Connections with Connectivism are clear and two ideas are reinforced. The first idea is that knowledge is distributed not only in a human being but also through our interspecies' empathy, which can also be found in non-human devices (a film, a song, an Internet browser, etc). The second idea is that human beings are continuously making connections beyond their cognitive analysis, expanding their knowledge in the shape of a network.

The main reference to link Connectivism to social or sociopsychological sciences can be found in the Network theory. This theory has its origin in the School of Gestalt and was given a first boost with the works about group's psychology of Lewin (1938) and the sociometry studies of Moreno (1962). Theorists of this proposal aim to analyze the behaviour as a group of a people network assuming that what people feel, think and do as a group has its origin and is shown in the guidelines of the situational relationships between them and not in their individual characteristics (Lozares, 2005). Therefore, a network would have an identity of its own and different in relation with its members, could be analyzed and would not be reducible to the contribution of each member.

This idea of social network implies a common knowledge, defined by Siemens (2013) as "Wisdom of crowds", and a network performance as a group, similarly to what happens with Connectivism. Moreover it has several applications in other sciences such as economics with micro and macro analy-

sis, mathematics through the “Graph theory [2] or computer science and the electronic social networks.

The last relevant reference for Connectivism can be established in the Complex Adaptive Systems (CAS) [3]. Complex Adaptive Systems are an interdisciplinary field of study which includes several sciences such as psychology, sociology, economics, genetics, biology, artificial intelligence, etc. and are commonly used to describe groups of interrelated elements that react in an adaptive way to the environmental changes. This term was initially adopted by the Santa Fe Institute in the 90s with Holland, Gell-Man and Forrest in the lead but it was easily popularized thanks to its potential to explain the environmental adaptation of complex systems within several sciences (Holland, 1996). According to Levin (2002), the main characteristics of the Complex Adaptive Systems are the diversity and individuality of its components, the local and specific interactions between those components and an autonomous process that uses the interactions results to replicate or improve a subset of said components; however, the feature that really defines a complex adaptive system is the adaptation. When a system adapts, it means that it learns, that there is a competitive selection and that only the more appropriate components survive, becoming the rule for replication (Forrest and Jones, 1994).

The concept of “learning” in Complex Adaptive Systems is mainly the same than in Connectivism concerning the performance of a network or ecology and for that reason Connectivism uses many of their statements. Connectivism also considers that the knowledge network changes by adaptation to the environment and only the most suitable decisions making for the current situation are selected, creating a network or system Darwinism. Also, the non-defined concept of “knowledge” according to Connectivism has the features of a complex adaptive system, meaning that knowledge does not have a defined shape because it depends on each specific environment, is under constant change or adaptation and expands and replicates constantly.

3. The more recent predecessors

This article, intended to reflect the basis of Connectivism, would not be completed without the reference to the most recent theoretical movements, contemporary with Connectivism, which in some way have left a mark on it, either inspiring its theories or modifying and improving its theoretical basis. Many of these theoretical approaches start from similar ideas and try to describe the process of learning in a society heavily influenced by new knowledge and information technologies, although for some reasons they had a minor impact compared to Connectivism, which has had a policy of open publications that has favoured a bigger international and scientific impact. (Santamaría, 2010, 2013).

The first reference to include is the Conversation Theory, originally suggested by Pask (1975) and later restructured by Laurillard (1993, 1999). According to this theory, the dialog between teacher and learner allows the construction and exchange of knowledge between them. In this way, the learner rebuilds the meaning of a given concept explained by the teacher and from this point, the teacher has to assess the learning using his own assessment methods. Therefore, it might be considered that there is an intrinsic feedback in the learning process through dialog because at least one phase of adaptation of the learning process by the learner has to be present (Martín, García Rueda and Ramírez Velarde, 2004).

This conversational process would be used to make knowledge explicit and to encourage the reflection as a Socratic method of learning. Both Connectivism and Conversation Theory are based in the creation of relationships as a source of knowledge, both through the connection of ideas and making relations with other people and thinking about it.

Another important reference is the Actor-Network Theory (ANT) [4], also known as “actant-rhizome ontology”. It is a sociological approach born in the 80s but theoretically developed at the end of the 90s mainly with the works of Latour (1999) and Law (1999). The Actor-Network Theory considers machines, objects and even discourses as actors at the same level than human beings, in a symmetric system where technological aspects develop a great importance. This theory implies that everything is connected with no distinction between human and non-human beings, and therefore technology, social processes and human beings are associated and studied at the same level in social analyses.

Another reference to analyze is the Network Learning (N-learning) of Polsani (2003), inspired in the works of Harasim (1995). Polsani suggests that the birth of the Internet has modified our way of learning, ending up in the creation of a place where virtual global knowledge is produced and to which we connect, enrich ourselves and learn through all our life. This network of knowledge and learning would be structured in different levels of knowledge and we would drive into these levels according to our needs. Both Connectivism and N-learning share the idea that knowledge and learning are distributed, can be found in non-human devices and are considered as live entities which are different from all their elements as a whole.

The birth of the Web 2.0 and its important influence over new pedagogic methodologies have motivated the creation of new theoretical approaches with influence in connectivist ideas.

Downes (2005), the main promoter of Connectivism together with Siemens, develops the idea of e-learning 2.0, with many features in common with Connectivism, which means an important change compared with the traditional e-learning. According to Downes (2005), e-learning 2.0 implies the integration of the Web 2.0 into the learning process. It means that the learner

takes part in their own learning process, is able to create contents and share them with others, learning can be done through more informal channels and knowledge is changeable, i.e. it is not organized in a hierarchical way and it can be modified or adapted according to the learner's needs. In conclusion, e-learning 2.0 implies an active participation of the electronic learner in their own learning process, even being a part of the learning process of other learners he is connected to.

Two new branches of education derived from e-learning and based on small pieces of learning are also clear references for Connectivism. These new branches are Microlearning and Nano-learning.

Regarding Microlearning, Hug (2005, 2007) claims that it is possible to schedule very effective learnings by means of small activities and short-term goals. These activities are based on micro-contents that are used later in wider knowledge or in the long term. Connectivism also considers the existence and usefulness of this microlearning, mainly in non intentional or creative learning, being in many circumstances the first steps towards a more advanced development in new subjects or different topics and working as an explorer for new routes in the knowledge network.

Regarding nano-learning (n-learning: nano-learning; do not confuse with N-learning or Network Learning), it implies a learning miniaturization even bigger than Microlearning. Drawing an analogy between nano-learning and nanotechnology, learning is subdivided up to the maximum (with a continued focus of only a bit longer than one minute), which guarantees a great performance in attention and a very high understanding by discovery, allowing a great diversification and customization for the learner (Masie, 2006).

Continuing with new tendencies based on new technologies, Barnes and Tynan (2007) present the need of a new university, because current university students are already users of the Web 2.0. and think that education based on the teacher and his knowledge is not sufficient. The term Web 2.0 arose to name the new webpages different from the web sites more traditional and called Web 1.0; the distinguishing feature is the collaborative participation of users. This new university is called University 2.0 and consists in putting an emphasis on new social network technologies within the university context. This way, the learner will be able to contribute knowledge while they are also learning and there will be no separation between the university content and the learner's reality. In this new university, similarly to Connectivism, the informal knowledge, which always has been considered as a minor learning in the university context, will acquire a great relevance. (Abella, Santamaría & Grande, 2010).

Linked to these ideas of adapting the whole educational context to the new virtual reality 2.0, other authors suggest the existence of a Curriculum 2.0 with the features of these new technologies. Curriculum is agreed between

students and teachers and is guided by the learner's needs (Bawden, Robinson, Anderson, Bates, Rutkauskine and Vilar, 2008). Thanks to this new customized curriculum the students would develop better management skills and access to knowledge, as this would be adapted to their learning pace and needs, which means an application of the connectivist principles.

According to authors such as McLoughlin and Lee (2007), the application of new information technologies to knowledge and education require important changes in pedagogy in the current context. This new way of handling education is called Pedagogy 2.0 and has to be adapted to the learner's needs in the current society. Some of the most important current requirements are the participation in learning networks and communities (whether social or virtual), the customization of learning activities according to each learner's pace and the emphasis on the production of knowledge, that is, to contribute knowledge and to receive knowledge. These features of customized learning, rupture of the learning context isolation and the horizontal and democratic knowledge are also basic ideas in Connectivism.

The introduction of new technologies in a pedagogical context can mean a great contribution to pedagogy, changing the usual concept of distraction. Brown (2006) considers the use of these communication devices (mobile phones, tablets, etc.) as an activity directly related to the efficient management of achievable information and communication. Learner has to be in contact with other learners and teachers, connect knowledge from their own perspective with their previous knowledge, share discovered knowledge and collaborate with other learners in their own learning process. Brown (2006) denominates this new perspective Navegacionism, whose bases are information management and continuous social interaction (Organista-Sandoval, McAnally-Salas and Lavigne, 2013).

4. Conclusion

After having presented all the references and predecessors related to Connectivism, it can be clearly concluded that this theoretical approach means an evolution from the existing theoretical knowledge instead of a real theoretical revolution, as it was stated in the initial thesis.

The main reason to think otherwise can be found in the analogy usually drawn between the current socio-technological revolution and the impact that Connectivism has in the pedagogical field. Whereas in the socio-technological aspect there is no doubt that it means a real revolution that modifies the existing basis, in Pedagogy and knowledge the evolution only suggests little adjustments and changes of perspectives, new ways of dealing with socio-pedagogical challenges and new chances to approach future opportunities in the educational context, which take advantage of the current great knowledge

in order to reinforce their basis and face a rather unclear future with better guarantees.

Currently, the learning theoretical approach of Connectivism offers numerous advantages that allow it to become the new learning theoretical paradigm for the vast majority of new researchers. These advantages can be summed up as the following:

- Continuity with the existing educational knowledge, as in most cases connectivist principles do not mean a rupture but a new approach.
- Easy application of connectivist principles to new technologies and learning methodologies, as it is in line with most of the current trends.
- High adaptation to the new generations of “digital natives” students, who increasingly identify themselves with the needs described in Connectivism.
- Higher coordination among different sciences and fields of study, as Connectivism is an approach which takes information from different theoretical fields to develop (Social psychology, information technology, neuroscience, computing science, etc.).
- Better comprehension of the current learning situation and future challenges, as Connectivism foresees a better understanding of a society in constant change and a knowledge continuously growing.

In conclusion, it can be predicted and justified a probable expansion and popularization of Connectivism in the educational context, considering the current evolution of information technologies and social networks, which for the moment are quickly expanding into every aspect of our community social life. For that reason, the educational context has to be adapted to new perspectives fitting in its principles in the best possible way and use these principles in order to guarantee the best possible education.

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Information Technology (I/T) in Nursing Education: Assessing Safety in the Process of Medication Administration

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Abstract: The twenty-first century is witnessing considerable changes in health care professions, including the nursing profession, and information technology is playing an important role in this transformation. Although, medication errors significantly affect the patient, but they are preventable events. This way, and also for the importance in the nurses' education, this study determined the impact of changing from a unit dose to an automated medication dispensing system (ADS) through all phases of the drug therapy process. The National Coordinating Council for Medication Error Reporting and Prevention (NCCMERP) taxonomy was used to measure medication errors. The use of the ADS showed a tendency towards a better classification of B/A category errors. Based on the new evidence in informatics is vital that we continue integrated and strengthened the educational curriculum with the new technologies to continue improving our health care system. It is important that nurses continue enhancing their competencies oriented in patient-centered.

Key-words: Information Technology (IT), Nursing Education, Automated Dispensing System (ADS), Safety, Medication Error, Harm.

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1. Introduction

During the 1990s, a revolution in the field of patient safety took place in the United States with the publication of the report titled *To Err Is Human: Building a Safer Health System* (Institute of Medicine, 2000). In 2001, The Institute of Medicine (IOM) published a report called *Crossing the Quality Chasm: A New Health Care System for the 21st Century* (Institute of Medicine, 2001), whereby the United States committed to continuing to improve healthcare systems with a vision including changes in the healthcare model based on safety, patient-centered care, effectiveness, efficiency, timeliness and equitable (Figure1).



Figure 1. Health Model System. Source: Institute of Medicine (2001).

Today, healthcare staff and administrators are required to use technical resources such as the Electronic Health Record (EHR) to improve healthcare quality, safety and efficiency. Nursing is rapidly involving into a technologically sophisticated practice discipline. In 2006, the World Health Organization (WHO), proposed the following: (OMS, 2009) 1. Establishing a patient safety taxonomy facilitating information classification to improve analysis and learning; 2. Pursuing methods to reduce risks in healthcare services; 3. Promoting research in the field of patient safety.

In 2005, the National Health System carried out the National Study on Hospital-Related Adverse Events, ENEAS for its Spanish acronym (Aranaz, et al., 2006). This study revealed a prevalence of adverse events of 9.3%, of which 43% were preventable, and the most frequent were related to the medication administration process, (Ibid). This study concluded that the

incidence of adverse events associated to medical assistance in Spanish hospitals is similar to studies carried out with comparable methodologies in Canada and New Zealand. The ENEAS publication proposes that the reduction of adverse events requires an organized and multidisciplinary system. To improve this process, nursing professionals have a key role in health outcomes and patient safety.

In 2014, WHO published a document that includes a reference to the evaluation of the phases of the drug therapy process and, the usage of agency guidelines, (OMS, 2014). These include the Institute of Safe Medication Practices (ISMP), the Joint Commission International for Patient Safety and the Joint Commission on Accreditation of Healthcare Organizations. By 2015, adverse events in the United States associated to medication constituted nearly 700,000 emergency room 5% of hospitalized patients, making these one of the most common types of inpatient errors, (AHRQ, 2015). Information technology on health (Hi-tech), was enforced under the American Recovery and Reinvestment Act Legislation in 2009. This legislation brings new adoption of technologies on health, with several objectives. We are going to make emphasis on: 1. Improves health care quality, reduces medical errors, and advances the delivery of appropriate, evidence-based medical care. 2. Reduces health care costs resulting from inefficiency, medical errors, inappropriate care, and incomplete information. 3. Promotes more effective health care marketplace through widely available, accurate health information.

Nurses will play an important role in the related transformation of the health care delivery system and are critical to the success of this overall strategy, particularly as it relates to the effective and efficient deployment of HIT, Institute of Medicine IOM, (Tietze & McBride, 2016). Although, the IOM report named the key processes of communication, cooperation, coordination, and collaboration in teamwork, the interprofessional competencies that underpin these processes were not defined. Also important to the elaboration of teamwork competencies are the interrelationships with the other four IOM core competencies. The other three core competencies, in the context of interprofessional teamwork, identify 21st-century technologies for teamwork communication and coordination (i.e., informatics); rely on the evidence base to inform teamwork processes and team-based care, and highlight the importance of continuous improvement efforts related to teamwork and team-based health care (American Association of Colleges of Nursing, 2011).

This way, and for the importance in the nurses' education, the objective of this study was to calculate the prevalence of errors between a unit dose system, and ADS in the phases of the drug therapy process, including prescription, transcription, dispensing and administration of medication in a general hospital to determine the safety and efficiency of the automated system.

2. Methodology

A cross-sectional study was carried out in a general service hospital in San Juan, Puerto Rico. The clinical services offered are: emergency rooms for adults and children, general medicine, surgery, maternity, nursery, pediatrics, adult intensive care unit, surgery room and recovery room. The sample of the study was composed of all medication discrepancy reports of the hospital's pharmacy department for 2014 and 2015, corresponding to unit dose dispensing system and the automated process of this system, respectively. The error categories by severity level have been established by the National Coordinating Council for Medication Error Reporting and Prevention (NCCMERP) (Table 1).

Category of Severity	NCC MERP definition
Category A	Circumstances or events that have the capacity to cause error
Category B	An error occurred but the error did not reach the patient (An "error of omission" <i>does</i> reach the patient)
Category C	An error occurred that reached the patient but did not cause patient harm
Category D	An error occurred that reached the patient and required monitoring to confirm that it resulted in no harm to the patient and/or required intervention to preclude harm
Category E	An error occurred that may have contributed to or resulted in temporary harm to the patient and required intervention
Category F	An error occurred that may have contributed to or resulted in temporary harm to the patient and required initial or prolonged hospitalization
Category G	An error occurred that may have contributed to or resulted in permanent patient harm
Category H	An error occurred that required intervention necessary to sustain life
Category I	An error occurred that may have contributed to or resulted in the patient's death

Table 1. Error classification according to severity. Source: NCCMERP (1998).

These serve as guidelines to categorize the types of harm that healthcare personnel can cause a patient during the treatment process. The categories are described as follows⁷: categories A to D cause no harm; and categories E to I indicate harm, classified as temporary, permanent, or potentially life threatening (NCCMERP, 1998).

2.1 Study variables

The principal variable under study was medication errors in ADS, classified by NCCMERP categories. The phases of prescription, transcription,

dispensing and administration were examined based on shift and clinic unit variables as predictors.

2.2 Medication error

As defined by the NCCMERP, a medication error is “any preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of the health care professional, patient, or consumer. Such events may be related to professional practice, health care products, procedures, and systems, including prescribing, order communication, product labeling, packaging, and nomenclature, compounding, dispensing, distribution, administration, education, monitoring, and use” (Ibid).

2.3 Procedure

The study examined all phases of the drug therapy chain with the medication dispensing systems: unit dose and ADS. Both systems work through manual prescription. After the Institutional Review Board (IRB) approval, data was collected from April through July 2016. The researcher designed the Data Collection Sheet for Medication Discrepancy Detection in Unit Dose and Automated Medication Dispensing Systems, to gather data from the medication discrepancies report from the hospital’s Pharmacy Department for the years 2014 and 2015. These reports are the result of the clinical pharmacy daily monitoring to guarantee safety in the administration of medication to patients. Alphanumeric codes were assigned to assure confidentiality.

2.4 Statistical Analysis

Data analysis was conducted using the Statistical Package for the Social Sciences (SPSS) version 23. To measure the error level, types of error, where the error occurs and prevalence, a descriptive analysis was undertaken based on central tendency and dispersion measures. An inferential analysis was performed using student’s t test for quantitative variables, chi square and binary logistic regression for qualitative variables. A multivariant analysis was carried out to identify possible confounding variables and identify predictive factors.

3. Results

Data was collected from 487 medical orders for the ADS and 514 medical orders for the unit dose system, for a total of 1,001 patients with medication error reports. The median age was 63 for men and 68 for women. The common diagnoses found were respiratory system conditions (21.2%), skin and subcutaneous tissue diseases (13.5%), gastrointestinal system

diseases (13.4%) and diseases associated with the circulatory system (11.7%). This study identified 1,507 medication errors in the drug therapy process: 1,175 errors corresponded to the prescription process (78%), 160 under the medication administration phase (10.6%); followed by the transcription stage with 104 errors (6.9%). The lowest percentage of errors was observed for the dispensing phase, for a total of 68 errors, representing 4.5%. Several types of errors were found in the drug therapy chain, as shown below (Figure 2).

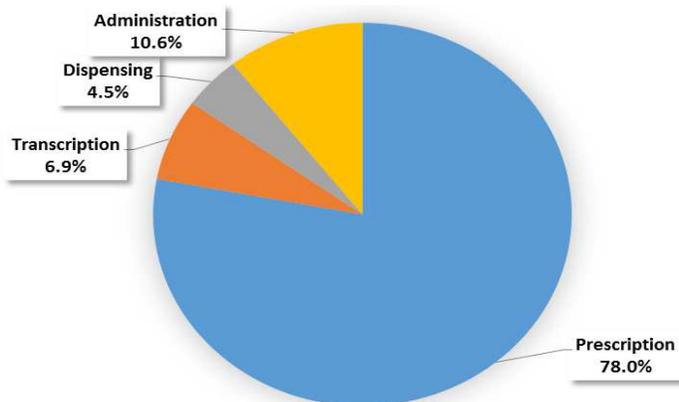


Figure 2. Percentage distribution of errors in medication according to the phases of the therapeutic drug process.

3.1 Prescription

Incomplete medical orders showed a distribution of 230 for the ADS and 234 for the unit dose system. In both medication dispensing processes, prescription errors responded to a lack of three characteristics: dose, route of administration, and frequency of administration. Missing dosage was identified for 99 patients (9.9%); the route of administration was missing for 146 patients and administration frequency was not present in the prescription of 235 patients. For both processes, the greatest percentage of errors in prescription phase corresponded to a lack of administration frequency. Another source of error was the use of non-approved abbreviations, with 161 cases in the ADS and 124 in the unit dose system. The use of Q.D., QD, q. d. and qd (daily) prevailed, with 103 patients for both processes: this represents a communication error. This finding is in accordance with the 2010 National Quality Forum Improving Patient Safety which establishes that the most common abbreviation resulting in a medication error was “QD” in place of “once daily,” accounting for 43.1% of errors, (NQFIPS, 2010).

3.2 Transcription

A greater number of error reports throughout all criteria was seen for the unit dose system (74.23%) when compared to the ADS, with 25.77%. The

criteria of *Transcription not performed* was the only one which was equal for both systems (6 cases each).

3.3 Dispensing

The criteria evaluated for dispensing were: erroneous dispatch, incorrect storage, incorrect dispensing frequency, no dispensing, delay, erroneous dosage, patient exchange and incorrect labeling. The unit dose system showed a greater amount of errors throughout all criteria (67.65%) when compared to the ADS (32.35%).

3.4 Administration

The criteria evaluated were: missed doses, additional doses administered, omission due to lack of transcription, administration of medication without a prescription, administration delay, incorrect transcription, incorrect route, erroneous dose, erroneous identification of the patient, with known allergies and incorrect medication. The unit dose system registered 71.88%, whereas the ADS registered 28.12%. The most commonly identified category was B, defined as errors which did not reach the patient, with 282 patients (57.9%) under the ADS process and 330 patients (64.2%) for the unit dose system. For category A, defined as events with the capacity to cause errors, a distribution of 184 patients (37.8%) was seen for the ADS and 140 patients (27.2%) for the unit

dose system. The use of ADS showed a tendency to improve errors from category B to category A. The Chi-Square test showed significant differences between the systems. An association was found between the medication administration process and error category as per the NCCMERP category $\{\chi^2(2, n = 1001) = 17.163, p < 0.001\}$ (Table 2).

Harm category according to the NCC MERP	Administration of medicine process				Total	
	Automated dispensing system		Unit Dose		f	%
	f	%	f	%		
A: Circumstances or events that have the capacity to cause error	184	37.8	140	27.2	324	32.4
B: An error that did not reach the patient	282	57.9	330	64.2	612	61.1
C: An error occurred that reached the patient, but did not cause patient harm	21	4.3	44	8.6	65	6.5
Total	487	100.0	514	100.0	1001	100.0

Nota. The result of the Chi squared test was: $\chi^2(2, n = 1001) = 17.163, p < 0.001$.

Table 2. Categories of harm reported according to the National Coordinating Council for Medication Error (NCC MERP) classification for the process of administration of medicine.

3.5 Automated Dispensing System (ADS) and Unit Dose

Fifty two percent or more of the patients classified under category A for the phases of transcription, dispensing and administration, whereas for the prescription phase, 64.3% of patients were classified in category B. In comparison, high percentages of category B were seen for the phases of prescription, transcription and administration. When comparing both processes regarding category A of NCC MERP, an error reduction was seen, 48.3% for unit dose vs. 66.7% for ADS. This result confirms that the use of health information technology is more efficient and reduces errors in the drug therapy chain. For the purposes of this study, criteria from the NCC MERP taxonomy were considered to distinguish verbal and written communication, as well as the human factor. Some factors considered for written communication were: illegible writing, use of abbreviations, use of a zero at the end, loss of decimal points, confusion of medication name, incomplete medication label, incomplete order, and incorrect identification of the medical order (incorrect patient). For the purposes of verbal communication, incorrectly fulfilled oral orders by phone, including the read-back process, were considered. Regarding the human factor, we included dosage calculation, medicine preparation, storage, transcription, packing and distribution errors. Results show that the highest errors (Table 3) for the phase of prescription were seen for harm category B, independently of the medication administration process.

Causes of error	Administration of medicine process				Unit Dose			
	Automated dispensing system			Total	A	B	C	Total
Communication	99 28.9%	238 69.6%	5 1.5%		342 100.0%	69 22.7%	232 76.3%	
Written Communication	94 28.3%	234 70.5%	4 1.2%	332 100.0%	68 22.6%	230 76.4%	3 1.0%	301 100.0%
Verbal Communication	12 37.5%	18 56.3%	2 6.3%	32 100.0%	1 5.3%	18 94.7%	0 0.0%	19 100.0%
Human Factor	15 55.6%	8 29.6%	4 14.8%	27 100.0%	15 28.3%	20 37.7%	18 34.0%	53 100.0%

Note. The harm categories are defined per the NCC MERP and interpreted as follows: A: Circumstances or events that have the capacity to cause error, B: An error that did not reach the patient and C: An error occurred that reached the patient, but did not cause patient harm.

Table 3. Categories of harm reported according to the classification of the National Coordinating Council for Medication Error Reporting and Prevention (NCC MERP) for causes of error and the administration of medicine process.

Significant differences were observed for verbal communication (incorrectly processed phone orders and read-backs), with 94.7% for unit dose vs. 56.3% for the ADS system. The cause of error classified as human factor included transcription and dispensing phases. 55.6% of ADS patients showed category A errors and 37.8% of unit dose errors classified under harm category B. For the prescription phase, where communication errors were common, non-approved abbreviations were among the most frequent errors with 40.99% for the unit dose system and 59.01% for the ADS.

In the case of the ADS, the most frequently repeated abbreviations were QD with 39.75%, U with 23.01% and qd (daily) with 16.74%. In the unit dose system, the abbreviations were QD (48.95%), cc (15.06%) and U (13.81%). Also, there were 378 orders whose medication name could cause confusion (Confused Drug Names), ordered in 609 occasions for a total of 37% for each medication administration process. The most frequent medications classified as Confused Drug Name for both systems were: Humalog, Lovenox, Lantus, Toradol, Invanz, Phenergan, Neurontin, Atrovent, Protonix, Solu-Medrol, Benadryl, Norvasc, Plavix and Lipitor. For the ADS, 51.6% of prescriptions were classified as harm category B, followed by 44.6% for category A. The pattern of the unit dose system was similar, with 56.7% of prescriptions classified as category B and 36.6% as category A. The study identified 91 orders with high-risk medications: 49.45% for unit dose and 43.95% for ADS. Cases identified as High Alert Medication were classified according to the NCCMERP category. 88.9% of prescriptions in the ADS were classified as category B, followed by 6.7% in category A. Under the unit dose process, 97.8% classified as category B and 2.2% under category A.

For the ADS, a total of 377 medication errors were registered upon examination of the 387 orders reported under this process. Analyzing medication errors by drug therapy phase, 646 errors were identified for the prescription phase, representing 88.1% of the 733 errors found in the aforementioned system. The amount of errors was significantly reduced in subsequent phases. The prevalence of medication errors during the prescription phase represented 38.9% of the 1,001 medical orders. For unit dose, a total of 744 medication errors were detected upon examining the 514 orders, with 529 errors identified during the prescription phase, representing 68.3%. The amount of errors in the other phases was significantly lower. The prevalence of medication errors for the prescription phase was 36.5%. The Levene's test for equality of variances ($p < .05$) leads to assume different variances. The registered t statistic and significance ($p < .001$) suggests that the differences observed in medication errors varied significantly between the ADS and the unit dose system. More errors were identified in the prescription phase for the ADS, whereas in the phases of transcription, dispensing and administration, comparatively less errors were found when compared to the unit dose process (Table 4).

Binary logistic regression showed high significance in all phases of the drug therapy process ($p < 0.05$), except for the transcription phase. Dispensing ($OR = 1.78$, $IC95\% 1.14-2.79$, $p < 0.05$) and administration errors ($OR = 1.63$, $IC95\% 1.15-2.32$, $p < 0.01$) were practically twice as likely to occur in the unit dose process. The overall percentage of the model is 54.4%.

	Levene's test for equality of variance		T Test for equality of means						
	F	Sig.	t	dof	Sig. (bilateral)	Difference in means	Standard error of difference	95% confidence interval for the mean	
								Lower	Upper
Prescription	25.706	.000	4.968	974.810	.000	.29731	.05984	.17987	.41474
Transcription	23.423	.000	-2.467	742.920	.014	-.09836	.03987	-.17663	-.02010
Dispensing	36.048	.000	-3.020	744.004	.003	-.06831	.02262	-.11272	-.02391
Administration	90.826	.000	-4.859	908.570	.000	-.13133	.02703	-.18437	-.07829

Table 4. T Test Summary for medication errors in the process of administration of medicine by drug therapy stage.

4. Discussion

The decentralized medication ADS have been recommended as one potential mechanism to improve patient safety and are now widely used in many hospitals, (Fung & Lung, 2009). The results of the present study show that the amount of medication error is less when using the ADS in all phases of the drug therapy process, except for the prescription phase. In all other phases of the drug therapy process, presenting the results for the ADS first, the percentages were as follows: transcription (25.05% vs 75.0%), dispensing (23.75% vs. 76.35%) and administration (28.1% vs 71.9%). A pattern of change for each phase close to 50% was observed, confirming that the use of technology supports the reduction of medication errors, promoting patient safety and better professional practice. These results are in accordance with those found by Mandrack and Cohen (2012), which propose that ADS provide a best practice to enhance medication security. The study describes that the taxonomy presents potentially confusing names as another cause of medication error. This finding is consistent with current research on medication errors. For example, according to van Doormaal and colleagues, 60% of the medication orders contained at least on prescribing or transcribing error, (van Doormaal, et al., 2009). In this study, the most commonly prescribed medications were Humalog, Lovenox and Lantus, which belong to the insulin and anticoagulant drug. Winterstein (2002) & Budnitz (2011), found the same medication class trend in a study conducted with Florida, USA classes. However, higher prescription frequencies of these medications in our

study could reflect distinctive morbid patterns for the sample, i.e. 10.6% diabetes prevalence, (Ruiz Armendáriz, 2015). The ISMP established a list of potentially confusing pairs of drug names: Humalog/Humulin, Lovenox/Levemir and Lantus/Lente. This study identified a total of 108 medications which fall within the confused drug named category due to the medication Administration process. A total 609 cases of confused drug named were documented. They were distributed as follows: 315 for unit dose and 294 for ADS. (Table 5). These findings significantly advance our knowledge by profiling those medications with a higher susceptibility to be confused in PR, and contrasting them with the ISMP lists. To our knowledge, such assessment has not been previously conducted.

Drug Name	Confused Drug Name	
	Spain	United States
Advair	-	Advicor
Aldactone	Aldactacine	-
Amaryl	Acovil, Ameride	Reminyl
Antivert	-	Axert
Aricept	Aranesp, Azilect	Aciphex, Azilect
Asacol	-	Os-Cal
Atenolol	Adolonta	-
Atrovent	-	Natru-Vent
Azitromicina	Azatioprina	-
Benadryl	-	Benazepril
Bupropion	-	Buspirone
Cardizem	-	Cardene
Cardura	-	Coumadin
Carduran	Carreidón, Condrosán	-
Carvedilol	-	Captopril
Celexa	-	Zyprexa, Celebrex Celebyx
Cisplatin(o)	Carboplatino	Carboplatin
Claritin (Loratadine)	Claritin Eye (Ketotifen fumarate)	-
Clonazepam	-	Clobazam, Clonidine, Lorazepam
Colace	-	Cozaar
Coumadin	-	Avandia, Cardura
Cozaar	CoVals, Fortzaar	Colace, Zocor
Dactinomycin	Daptomicina	-
Daptomycin	-	Dactinomycin
Depakote	-	Depakote ER
Desirel	-	Seroquel
Dexametasona	Bucometasana, Doxazosina	-
Diflucan	-	Diprivan
Digoxin	Dilutol, Doxazosina,	-

	Doxepina	
Diovan	-	Dioval, Zyban, Darbon
Dulcolax (bisacodyl)	-	Dulcolax (docusate sodium)
Dulcolax (docusate sodium)	-	Dulcolax (bisacodyl)
Enalapril	Anafranil	Elavil, Ramipril
Epinephrine	-	Ephedrine
Fentanyl	-	Sufentanil
Fioricet	-	Fiorinal
Flovent	-	Flonase
Fosamax	Topamax, Fosavance	-
Glipizide	-	Glyburide
Glyburide	-	Glipizide
Guaifenesin	-	Guanfacine
Humalog	Humalog basal, Humalog mix, Humulina	Humulin, Novolog
Humulin	-	Novolin, Humalog
Humulin 70/30	Humalog mix 75/25	-
Inderal	-	Adderall
Invanz	Simdax	Avinza
Januvia	-	Enjuvia, Janumet
Kepra	Kaletra	Kaletra, Keflex
Lamictal	Lamisil	-
Lantus	-	Latuda, Lente
Lasix	-	Luvox
Levaquin	-	Lariam
Levothyroxine	-	Lamotrigine, Lanoxin, Liothyronine
Levotiroxina	Levetiracetam, Levofloxacino, Levomepromazina	-
Lipitor	-	Loniten, Zyrtec
Lopid	Lacipil	-
Lopressor	-	Lyrica
Loratadina	Lovastatina	-
Lorazepam	Lormetazepam	Aprazolam Clonazepam, Lovaza
Lovenox	-	Levemir
Metformin	-	Metronidazole
Metoprolol succinate	-	Metropolol tartrate
Metronidazol	Metamizol, Metrotrexato	-
Metronidazole	-	Metformin
Metotrexato	Methergin, Metrodinazol, Mitoxantrona	-
Mirapex	-	Miralax
Morfina	-	Hydromorphone, Morphine non concentrate oral liquid, Morphine oral liquid concentrate

Narcan	-	Norcuron
Neupogen	-	Epogen
Neurontin	Neobrufen, Nervobión	Motrin, Noroxin
Normodyne	-	Norpramin
Norvas	Norvir, Novonorm	-
Norvasc	-	Navane
Novolin	-	Humulin, Novolog
Pentoxifilina	Pectox lisina	-
Percocet	-	Darvocet, Procet
Phenergan (Fenergán)	Efferalgán	-
Phenobarbital	-	Pentotorbital
Plavix	-	Pradax, Pradaxa, Paxil
Prednisone	-	Prednisolone
Pristiq	-	Prilosec
Procardia XL	-	Protain XL
Protonix	-	Lotronex, Protamine
Risperdal	Rubifén	Restoril
Sandostatin	Sandimmun, Somatostatina	Sandimmune
Sertraline	-	Cetirizine, Soriatane
Sinemet	Serevent	Janumet
Singulair	Sintrom	Sinequan
Solu-Cortef	-	Solu-Medrol
Toradol	Foradil, Tirodril, Tramadol	Foradil
Tramadol	Toradol, Tapentadol, Tromalyt, Xumadol	Trazodone
Tricor	-	Tracleer
Tylenol	-	Tylenol PM
Ultracet	-	Duricef
Ultram	-	Lithium
Xanax	-	Fanapt, Tenex, Zantac
Wellbutrin SR	Wellbutrin XL	Wellbutrin SR
Zantac	Zarator	Xanax, Zyrtec
Zestril	Sutril	Zegerid, Zetia, Zyprexa
Zitromax	Zovirax	
Zocor	Rocoz, Zarator	Cozaar, Zyrtec
Zyrtec		Lipitor, Zantac, Zerit, Zocor, Zyprexa, Zyrtec-D
Zyvox		Vioxx, Zovirax

Medication Administration Process Results

Automated medication dispensing system (ADS)	294
Unit dose system	315
Total	609

Table 5. List of Confused Drug Names by instances of possible occurrence by drug administration process

It also established a list of high alert medications, which can cause severe harm when used by mistake, including death, (Anderson & Townsend, 2015). The highest percentage corresponds to opiates with 45.4%, insulins with 18.6%, and anticoagulants and sedatives with 5.2% each. This study allowed to establish that the integration of technology into the drug therapy process and change in procedures minimize the incidence of harm to the patient, thus ensuring reliable health services. The application of the conceptual framework for the WHO's International Classification for Patient Security (2009) helped in the analysis of both processes to enhance patient safety. This conceptual frame encompasses ten areas: Incident Type, Patient Outcomes, Patient Characteristics, Incident Characteristics, Contributing Factors/Hazards, Organizational Outcomes, Detection, Mitigating Factors, Ameliorating Actions, Actions Taken to Reduce Risk (Figure 3). Its application in this study is described below: Contributing Factors/Hazards: Human Factors / Communication and steps in the medication process Incident Type: Medication (Prescription) Administration Process Patient Characteristics: Demographics and diagnosis (Figure 3).

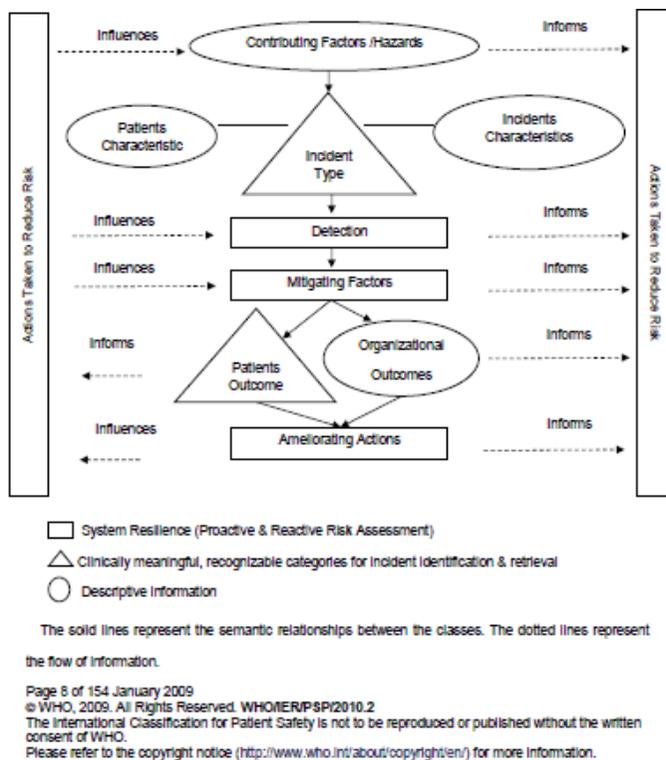


Figure 3. The Conceptual Framework. Administration Process Patient Characteristics: Demographics and diagnosis

The study complied with one of the 2008 WHO global research priorities, based on the topic of adverse events due to drugs and medication errors, (WHO, 2009) as the medication error distribution was estimated and the NCCMERP taxonomy was used to establish error severity upon establishing the harm. Scientific literature shows that this taxonomy is universally employed to determine the category of harm, (van Doormaal 2009, Ferracini 2016 & Pasto Cardona, 2009). Implementation of new technology, such as ADS, standardized the medication administration processes, decreased turnaround time for processing medication orders, increased accuracy of medication administration to patients, and reports benefits, such as cost savings, reduction in the overall weekly stockout percentage, and estimated cost avoidance attributed to the reduced potential for product expiration (Skibinski, 2007 & McCarthy, 2016). This is an aspect that can be studied in a future research in the Puerto Rican context. Other strategies have been proposed to reduce medication errors, such as standardized protocols for high-risk medications (NID, 2016) and medication kits ADS, (Baldwin, 2004 & Arrowood, 2015).

The study presents ADS as a useful tool to reduce medication errors. This finding reaffirms that ADS are one of the most important safety enhancements that have evolved in the last decade and continue to improve medication use at the dispensing and administration phases, (Mandrack, 2011 & Pedersen, 2012). In other words, the increase of technology introduction promotes efficiency, quality and safety in healthcare. Errors can occur at any point of the drug therapy process. Prolong hospital stays, increase hospitalization expenses, and lead to more than 7,000 yearly deaths in the United States. The estimated cost for each error is \$2,000 to \$8,750 dollars. Literature points out that nursing professional intercept 50% to 86% of medication errors before they reach the patient, (Anderson & Townsend, 2015).

The results of our study show that the amount of medication errors decreases when using the ADS in all phases of the drug therapy process except for the prescription phase. For nursing professionals, ADS use can help reduce or eliminate delays due to medication availability, missing doses, and controlled substance counts, (Mandrack et al., 2012) To ensure patient safety, nurses must expand their knowledge and understand the use of epidemiology, communication and technology for improved performance and autonomous practice, (Ministerio de Sanidad y Consumo 2009, CPSSQ 2013 & Flin et al. 2003).

Limitations: At the data collection process, medical prescriptions attached to the pharmacy report were considered and determined to be illegible. Some discrepancies reports presented incomplete information. The Data Collection Sheet did not consider all possible medication errors, but

rather the most common ones. Important criteria for the safety category were considered under “others” for each phase of the drug therapy process.

5. Conclusions

The application of health information technology reduces errors in the therapeutic drug chain, validating that the use of automated dispensing systems represents a first-rate example of evidence-based practice to improve patient safety. Based on the study results, we conclude the following: (1). ADC is more efficient than unit dose. When using ADC, the medication error prevalence decreases in all phases of the drug therapy process, except prescription phase. (2). For the Dispensing and Administration phases it was found that for every error in the ADC there are two errors in the unit dose system. (3). ADC minimizes the type of error that causes harm to the patient.

The purpose of technology information systems is to improve patient safety, academic collaboration and research. That is why technology will allow all types of healthcare systems to investigate and analyze their incidents, allowing health organizations to make a real difference in patient safety. Technology has the potential to increase patient participation, facilitating patient-centered care based on evidence, thus complying with the model for the transformation of the health system based on safety. Information technology has shown to improve the quality, safety, quality and care of the patient, as well as reduce and mitigate human errors. Based on the new evidence in informatics is vital that we continue integrated and strengthened the educational curriculum with the new technologies to continue improving our health care system. It is important that nurses continue enhancing their competencies oriented in patient-centered. The competencies are: 1. Interprofessional team work. 2. Interprofessional communication practice. 3. Roles & Responsibilities for Collaborative Practice. 4. Values / Ethics for Interprofessional Practice (American Association of Colleges of Nursing, 2011).

The results of this study are important to prepare health professionals with the appropriate interprofessional skills for the 21st century. Mastering communication and teamwork should be reinforced at the curricular level since they facilitate a superior centralized care for the patient. The application of technology for teamwork improves the coordination and quality of the services offered. Conflict of interest: none of the author claim any conflict of interest.

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Evaluation and Assessment Practices in Early Childhood Care: A Theoretical Approach to Training

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Abstract: The roles of caregivers in early childhood education and care unit in Nigerian education sector is enormous, as this level forms the foundation of the education a pupil will be exposed to in his or her life time. It is important therefore for the caregivers to know how to accurately assess their pupils because the information generated at this level represents the placement of individual pupils in future educational level. Base on the above premise, no responsibilities is more important or more central to the work of the caregivers than that of assessing pupils' performance accurately and not only just on the paper and pencil system of assessment that is common in our educational system. Thus, this paper explores the following items: (1) meaning of measurement, (2) assessment, (3) evaluation, (4) comparism between formative and summative evaluation, (5) method of assessment and evaluation in early childhood education and care, (6) purpose of assessment and evaluation in early childhood education and care, and (7) the need for periodic evaluation in early childhood education and care. After the analysis of these items the article recommends: (a) there should be periodic workshop for caregivers on how to efficiently assess and evaluate their pupils' performance progress, (b) the objective of each unit of instruction must be clearly stated for accurate evaluation of the predetermined change in behaviour of the pupils, (c) adequate logistic should be provided for effective assessment and evaluation to enhance desirable pupils' performance.

Key Words: Assessment, Evaluation, Educationall Practices, Early Childhood Education, Teacher Training.

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1. Introduction

The misconception of the meaning and relationship that exist among the concepts involve in making value decision on the pupil's performance or academic progress has been one of the sources of confusion, when literate members of the society who are non- assessment experts are involved in discussions, they use the following terms measurement, assessment and evaluation loosely as being synonymous. Measurement is a process that assigns by rule a numerical description to observation of some attributes of an object, person or event. Assessment is a process of arranging or fashioning data into an interpretable form. Assessment focuses on a number of variables judged to be important and utilize a number of techniques to gather data from multiple sources. Evaluation is the continuous inspection of all available information concerning a pupil, caregiver, educational programme, teaching and learning process to ascertain the degree of change in pupils and form valid judgment about the pupil and the effectiveness of the programme.

Measurement is the assignment of a number to a characteristic of an object or event, which can be compared with objects or event. The scope and application of a measurement is dependent on the content and discipline. It is a cornerstone of trade, science, technology, and quantitative research in many disciplines. *Assessment* is the process of gathering, recording and using information about a learner response (performance/achievement) to a task because it is intended to cover a wide range of different circumstances. It does identify what are usually regarded as the key elements of assessment in education. *Evaluation* is a systematic determination of a subject's merit, worth and significance, using criteria governed by a set of standards. It helps in decision making or to ascertain the degree of achievement or value in regard to the aim and objectives and results of any such action that has been completed.

The relationships between these terms that is one leads to another. If a test is conducted, the steps is to mark and assign numbers to each items, then mark right or wrong, then later judge whether passed or failed which is evaluation (Adeleke, 2009, Santrock, 2014).

Early childhood education is not about teaching, it's about exploration and learning. According to national policy on education (2014), it is segmented into ages 0-4 years, situated in daycare or crèches, fully in the hands of the private sector and social development whilst ages 5-6 (pre-primary) are within the formal sector. In early childhood education, sector, the caregiver is very important and they cannot work in isolation without the child and the school.

NPE (2004), states that it is the education given to children prior their entry into primary school. The government of Nigeria states that it a

compulsory sector in order to reduce the rate of neglect and human trafficking.

The roles of caregivers in early childhood care and education and care unit in Nigerian education sector is enormous, as this level forms the foundation of the education a pupil will be exposed to in his or her life time. It is important therefore for the caregivers to know how to accurately assess their pupils because the information generated at this level represent the placement of individual pupils in future educational level. Based on the above premise, no responsibilities is more important or more central to the work of the caregivers than that of assessing pupils' performance accurately. It is possible for an individual caregiver to be more energetic, knowledgeable and full of pedagogical skills in handling these younger ones but if such a caregiver is unable to accurately, consistently assess and evaluate the performance of his or her pupils, he or she is not doing justice to the pupils (Mertler, 2003).

In other words, the major responsibility placed on caregivers in early childhood education and care is the periodic communication of academic, social performance and progress of pupils to a variety of audience. These audiences include parents, administrators and the general public as well as individual pupils; and when the results of assessment and evaluation judgment made about a pupils performance are not accurate, such a caregiver will be providing mis-information to the various recipients of the information. For years in Nigerian education, there existed a singular approach for assessing what students could and could not do. This primary means of assessment which involves the use of pencil-and-paper testing is known as traditional assessment of pupils' performance is informal. In practice, the majority of assessments upon which grades and other evaluation decisions are based come from these formal written tests. The two main categories of traditional formal written test items are objective and subjective items (Trice, 2000).

The term assessment refers to the procedures and processes employed in collecting information or evidence of human behaviour. It is a systematic process of collecting and interpreting information to aid making informed decisions. Educational assessment in early childhood care and education ,may be seen as a systematic and deliberate attempt to determine pupils' status in relation to predetermined educational variables of concern. It is concerned not only with tests but with other tools such as: observational schedule, anecdotal records, interviews, rating scales and socio-metric methods e.t.c which can be used to obtain a realistic observation of the individual. Assessment involves all methods in which tests may be used, thus leading to some measurement or quantification of results. Assessment is much more embracing and comprehensive than test and measurement. It is used to obtain a comprehensive record of a person's behaviour in a teaching and learning situation. (Adeleke,2009).

Moreover, Airasian, (2000) defined an assessment system as the process of collecting, synthesizing and interpreting information to aid in educational decision making. It is important to note that this system of assessment is a process; it is not a single entity. An assessment system is not a much broader concept. It refers to a related series of measures used to determine attributes of individuals or group of individuals. It is important to note that all pupils have the right to be assessed in fair and impartial ways, regardless of individual situations. Classroom caregivers have various responsibilities in support of fair assessment. These responsibilities include ensuring that pupils are properly motivated to do their best on any type of assessment (Oosterhof, 1999). Every child that is assessed must be evaluated to pass a valued judgment on them.

Evaluation is often described as the process of making a value judgment about pupils' skills or capabilities. Evaluation transcends measurement, not only to quantify performance, but also to judge the merits of that performance. Evaluation typically follows measurement and other assessment related activities conducted by the caregivers in early childhood education and care. Likewise evaluation often requires a substantial degree of professional decision making by classroom instructors. Since, this decision making process has the potential for very important repercussions, it should occur only after adequate samples of assessment information have been collected, analyzed and synthesized (Chase, 1999).

Likewise, Imas and Rist, (2009) asserted that evaluation can be used to address such questions as what is taking place (descriptive question) and normative questions such as comparing what is taking place with what should be taking place. Evaluation assesses activities to establish whether or not target objectives of the programme are achieved or not. Hassan, (1983) explained evaluation as the determinant of the congruence between performance and objectives. Stufflebeam and Shinkfield (2007) described evaluation as arguably the society's most fundamental discipline as it is oriented at assessing and helping to improve all aspects of the society.

Evaluation enables us to compare the actual outcome with the expected outcome and to arrive at conclusions about these comparisons with a view for taking future action. This is obviously a vital phase, because without some quantitative and qualitative comparison of actual and expected outcomes, it is impossible to know whether objectives have been realized and if they have been, to what extent? Without some systematic development of benchmarks, it is impossible to tell whether behaviours, in the form of attitudes, value, skills and knowledge, e.t.c. have been instilled, inhibited or altered. In this regard, Alkin (1970) cited in Bamidele, (2004) defined evaluation as the process of ascertaining the decision to be made, selecting related information and collecting and analysing information in order to report summary data useful to decision makers in selecting among alternatives.

There are two main forms of evaluation –formative and summative. Ayodele, Adegbile and Adewale (2003) distinguished between these two forms of evaluation. Formative evaluation, according to them, is a type of evaluation that guides the implementation of a programme. The primary aim of formative evaluation is to obtain evidence about the worth or adequacy of a programme while it is in progress. The continuous assessment plays a very prominent role in this regard. All the mistakes are corrected as the programme is going on. Summative evaluation is carried out when the programme has been completed. It aims at collecting evidence in order to judge the worth or adequacy of the whole programme or learning process.

Formative Evaluation	Summative Evaluation
How are you doing?	How did you do?
Occurs during the process of learning	Occurs at the completion of instruction
Assesses progress in a unit of lesson	Summarizes achievement in a unit of lesson
Directs learning to achieve objectives	Assesses objectives achievement
Grade may not be assigned	Assigns grades
Provides feedback	Provide feedback

Table 1: Comparison between Formative and Summative Evaluation. Source: McDonald, (2011)

In the school system, summative evaluation is usually done at the end of a lesson, a term, a semester or a year. Examples of summative evaluation include the final primary school leaving certificate examination popularly known as “common entrance”, senior secondary school certificate examination (SSCE) conducted by WAEC and NECO, semester and final degree examinations in higher institutions of learning. Likewise in nursery sections, the evaluation is done at every interval for holistic development of children. Evaluation of pupils’ progress is necessary for the new and ever changing educational policy to provide useful information to programme designers, implementers, beneficiaries and researchers to monitor the extent of the success of programme so that decision can be made either to continue or discontinue the programme, improve its practices and procedure, add to or drop specific strategies, institute a similar programme elsewhere, allocate resources among competing programmes, accept or reject programme approach or theory (Igwe, 2001).

2. Method of Assessment in Early Childhood Care and Education

2.1. Observation Method

Instructional objectives direct the choice of strategies for a school programme and provide a sounding board for evaluation of that programme.

Information use in evaluation of pupils' progress and the effectiveness of the school programme can come from observation of the pupils. The input information (data) is collected by observing pupils individually and collectively. Observing is often seen as one of the most simple, yet effective methods of assessing young children as they develop (Ronspreewenberg, 2015).

Caregivers can collect assessment data about pupils through observation. Since, "beauty is in the eye of the beholder" perception of individuals and situation may vary among observer. Caregivers can use observation of pupils to aid in drawing conclusions and making decisions. Observation is valuable because proper use of it permits the educational process to serve the needs of pupils better. The caregiver observes pupils in a wide variety of situations and if observations are well planned and structured the quality and value of the information increases.

Direct observations allow the actions to speak for themselves in a natural way. The best way to determine how well a pupil uses English Language is to observe his or her language in a number of natural settings to determine how well the kindergarten pupil has conceptualized the principle of one to one correspondence, asks the child to decide how many cartons of milk will be needed for the class at lunch time. Observation can be carried out at almost any time and is quite versatile. Observation has the following strengths: it allows action to speak for itself; it can be carried out at almost any time; it is versatile; it allows a record for future interpretation; it provides for direct comparison overtime; it is useful with non-readers, young children and the mentally handicapped; it identifies the level of skill development; it may be less threatening than some other type of data collection procedure. However, the following are the weakness of observation; it is time consuming; it may be too expensive; it may use supplementary devices that alter natural and on-going events; it may reflect observer biases. Systematic observation can be used for observing children in class or at play. It can also be used for assessing the characteristic, contribution of individuals to group discussion (Yoloye, 2008).

For a child provider or educator, observing a child begins with noting how each child behaves, learns, reacts to new situations and interacts with others. Later, then reflects on this information and determine how it can help one to improve on ones classroom to meet the need of the young learners (Spreeuwenberg, 2015). Importance of Observation:

- *Getting to know the children.* Observing the children in one's care can help to better understanding of the strengths and weakness of each individual child.
- *Tracking progress.* Once observed, one will be able to monitor the progress of each child's development over time.

- *Identifying Issues*. By understanding individual progress of each child through systematic observation, one may discover that a certain child is struggling or falling believing in one more areas of development.
- *Better assessment*. It allows one to get a more accurate reading on a child's true developmental progress. Recorded observation can show a much more accurate picture of a child's performance in the most important developmental areas. (Spreeuwenberg, 2015)

2.2. Rating Scaling method

Rating scale is a device that permits an observer the opportunity to record the intensity or degree of impression made while observing a subject or setting. The caregivers can find many opportunities to collect information from pupils by the use of scales. A second use of scaling allows self-rating by a subject on perceptions or impression of self-reports and it is widely used in psychological measurement where personal attributes are of concern. Important reasons for using rating scale are: to eliminate reflection on what happened through memory; to give a way of structuring a recording process that is efficient for the observer and that does not interfere with what is being observed; to get a detailed record of behaviour. A rating scale is an instrument used for assessing attributes which cannot be easily broken down into separate observable behaviours or task for instance, human attribute like "initiative" "originality" "enthusiasm". A rater in assessing such attribute is expected to estimate how much of the attribute the person possesses on a provided scale (Yoloye 2008)

Testing method: Over the years educators have found that a well prepared test, if administered and scored properly, is an efficient means of collecting information about the progress of the pupils. The major function of classroom testing is to measure pupils' achievement. As long as a test score is not used as a single criterion for decision making, scores on standardized that can supplement other data collection and support sound decisions. Test is an instrument, devices or procedure that purpose a sequence of tasks to which a pupil is to respond the results of which are used as measures of a specified trait. The on-going every day activities in classroom requires caregivers to use variety of techniques to assess the progress of pupils. The most often used technique is the administration of paper and pencil test that presents selected tasks to pupils in writing and require the pupil to respond symbolically.

It is important to note that appraisal for pre-school classes, primary grades and severely handicapped pupils relies extensively on evaluation of performance because these pupils have not developed the verbal and writing skills necessary for taking paper and pencil tests. Appraisal is likely to have a large component of performance evaluation. Likewise, caregivers may

employ assignments and projects to help pupils apply information they are acquiring and to develop good study attitude and social skills as well as enhance physical, cognitive development at all educational levels (Popham, 2002).

1. *Achievement test*. These tests are designed to assess current performance in an academic area. Because achievement is viewed as an indicator of previous learning, it is often used to predict future academic success. Individual achievement is determined by comparison of results with average scores derived from large representative national or local samples. Scores may be expressed in terms of “grade-level equivalents”; for example, an advanced third-grade pupil may be reading on a level equivalent to that of the average fourth-grade student.
2. *Aptitude Test*. These tests predict future performance in an area in which the individual is not currently trained. Schools often use aptitude test when assigning individual to specific groups. Vocational guidance counseling may involve aptitude testing to help clarify individual career goals.
3. *Objective Personality Test*. These tests measure social and emotional adjustment and are used to identify the need for psychological counselling. Items that briefly describe feelings, attitudes, and behaviours are grouped into subscales, each representing a separate personality or style, such as social extroversion or depression.
4. *Intelligence Test*. In contrast to tests of specific proficiencies or aptitudes, intelligence tests measure the global capacity of an individual to cope with the environment. The early intelligence scales yielded a mental-age score, expressing the child's ability to do as well as average children who were older, younger, or equivalent in chronological age (Adeleke 2009).

2.3 Anecdotal record method

An objectively written description of a pupil's behaviour, what was said or done in a specific situation recorded as being typical or unusual behaviour. Evaluation of pupils' performance progress is integrated into classroom activities keeping in mind four basic aspects of performance.

- *Decision situation*. Reason for the assessment: specifies the information you need.
- *Exercise*. Task given to pupils that require performance, specifies what the pupil is to do
- *Response*. Actual pupils performance, specifies the behaviour or product evaluated

- *Rating*. Evaluation of performance, specifies method used to judge performance

Anecdotal records are useful in a variety of situations such as observing social adjustment of pupils, personal and social development, identifying unintended learning outcomes, and identifying difficulties which pupils' experiences in executing projects and learning activities, as well as identifying interest and work habit (Okpala, Onocha and Oyedeji 2012)

Summarily, in this era of triangulation in classroom assessment it was discovered from many literatures (Popham, 2002, Yoloye 2008, Okpala, Onocha and Oyedeji 2012) that a method cannot be apply solely in classroom assessment but rather the care-givers must be well abreast of all the aforementioned me.

Checklist. Rating scales and rubrics are tools that state specific criteria and allows teachers and student to gather information and to make judgment about what students know and can do in relation to the outcomes. They offer systematic ways of collecting data about specific behaviours knowledge and skills. The quantity of information acquired through the use of checklists, is highly dependent on the quality of descriptors chosen for assessment. The benefit also depends on students direct involvement In the assessment and understanding of the feedback provided. The purpose of checklist is to provide tools for systematic recording of observations, provide tools for self assessment ,provide samples of criteria for students prior to collecting and evaluation data on their work record, record the development of specific skills, strategies, attitudes and behaviours necessary for demonstrating learning clarify students instructional needs by presenting a record of current accomplishment. It is usually offer as yes/ no format in relation to student demonstration of specific criteria (Kostelnic, Soderman and Whiren, 2011)

Portfolio. Is a record of the child's process of learning, what the child has learned and how she has gone about learning, how she thinks, questions, analyzes, Synthesize, produces, creates, and how she interacts- intellectually, emotionally, socially with others. It can be defined as purposeful collection of students work that exhibit to the student, or others, her efforts or achievement in one or more area. Portfolio enable children to participate in assessing their own work; keep track of individual children's progress; and provide a basis for evaluating the quality of individual children overall performance.

Inventory. Is a behavior rating scale that screens for emotional and behavioral disorders in children between 3 and 5 years old (Kostelnic, Soderman and Whiren, 2011, Santrock, 2014).

3. Purpose of Assessment and Evaluation in Early Childhood Education and Care

Planning, Conducting and Evaluating Instruction Delivered. Caregivers need to periodically carry out assessment in order to help themselves in making decisions at a variety of levels. The most basic and important purposes of assessment is to assist in making decision about the worthwhile of instruction. Assessing for instruction is not complete at the end of the day when a lesson is done. Instead, effective caregivers consistently assess and evaluate their instruction after its completion for the purpose of making alterations to enhance productive classroom interaction.

Diagnosing Pupils' Difficulties. Assessment methods are often used prior to instruction in order to determine what the pupils already know and can do. This is important in helping the caregivers to plan for instruction. This type of assessment will help the caregivers to pin point the distinct type of difficulties pupils may be experiencing and remediate it.

Placement of Pupils. Data collected in the process of assessment are used in placing pupils into various groups in the classroom. In fact caregivers may use the results of groups based on similar level of ability to organize pupils for other classroom activities.

Providing Feedback to Pupils (formative evaluation). Assessment result is used to provide feedback to pupils regarding their socio-metrics and academic progress.

Grading and Evaluating Academic Learning. Data generated from assessment exercise will help the caregivers to evaluate pupils' learning at the end of a unit, a grading period or a school year.

The Need for Periodic Evaluation in Early Childhood Care and Education:

1. Frequent changes in the system of education call for periodic evaluation in all level of education, for instance, Nigeria education system changes from 6-5-4 system of education to 6-3-3-4 and presently the nation is operating 9-3-4 system of education.
2. The need to occasionally revise instructional resources and methods, such that, it will reflect the changing characteristics of the pupils and likewise, to acquire new knowledge and orientation of the contemporary world and make instruction pupils-friendly.
3. Sometimes, existing content of educational programmes are criticize as obsolete to the need of the societies by the stakeholders. Therefore, there is need for periodic evaluation to ascertain the relevance of the present educational package to the learners and general societies.

4. Expansion of developmental activities, sometime may give rise to request for evaluation of existing educational programme.
5. Stakeholders a times may want to know whether the new programme is producing result to the need of the societies. In other words, evaluation may emerge through worried from stakeholders coming from the performance of the pupils.
6. Sometimes, textbooks of the past and present do not reflect contemporary emphasis.
7. Mode of instruction sometime comes under criticism, for instance the method of learning under the traditional education system i.e. learning by memorization and conventional methods was highly criticized by the stakeholder, which justify the need for periodic evaluation in early childhood education and care (Bamidele, 2004).

4. Conclusions

Attempt has been made to explore, meaning of measurement, assessment, evaluation, comparism between formative and summative evaluation, method of assessment and evaluation in early childhood education and care, purpose of assessment and evaluation in early childhood education and care, the need for periodic evaluation in early childhood education and care. Summarily, it is important to note that all pupils have the right to be assessed in fair and impartial ways, regardless of individual situations. Classroom caregivers have various responsibilities that they must carry out efficiently in support of fair assessment. Recommendations:

- i. There should be periodic workshop for Care-givers on how to efficiently assess and evaluate their pupils' performance progress.
- ii. The objective of each unit of instruction must be clearly stated for accurate evaluation of the predetermined change in pupils' behaviour.
- iii. Adequate logistic should be provided for effective assessment and evaluation to enhance desirable pupils' performance.
- iv. Caregivers should be exposed to rudiment of evaluation so as to know the appropriate tools for data collection.
- v. The caregivers should be objective in their assessment. In other words, they should avoid prejudice.

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Perceptions on the Intercession of the Student of a Mediation Master: Strategies of the Methodology of Prevention and Resolution of Conflict (2016-2018)

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Abstract: The present diachronic study describes an innovative experience with the postgraduate students who study within the Master of mediation: strategies and methodologies of prevention and conflict resolution of the Pablo de Olavide University, during two academic years 2016/17 and 2017/18 . The priority objective that was sought with this diachronic investigation was to assess the prevalence of the concepts of "Mediation" incorporated into the repository over the period of time studied. Through a methodology of descriptive character and of qualitative cut, the design and elaboration on the part of the students of clouds of ideas developed with the social software WordArt was analyzed on the conceptions related to the process of mediation from the contents taught in the theoretical and practical modules. Finally, to make a comparison between the prevalence of the relevant concepts for the group of students, we observe a predominance of four concepts that stand out from the diachronic study: "Communication" "Empathy" "Agreement/Solution" and "Resolution of Conflicts". There are, therefore, the main concepts in which they formed.

Key-Words: Mediation, Concepts Cloud, University Innovation, Information Technology.

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1. Introduction

This experience develops in graduate Master in Master in Mediation: Strategies and methodologies prevention and resolution of conflicts linked to the Center for Postgraduate Studies at the Pablo de Olavide University (UPO) in Seville.

It is a blended Master's degree with teaching and virtual support through the Blackboard learning platform (UPO) and with internships in companies. It consists of 60 credits (ECTS) and belongs to the branch of Social and Legal Sciences of the Pablo de Olavide University. Its URL is <https://www.upo.es/postgrado/Master-La-mediacion-estrategias-y-metodologias-de-prevencion-y-resolucion-de-conflictos> (Figure 1).

As indicated in its presentation, the Master is based on the assumptions of mediation, and, in its resolution of conflicts. In addition, one of the training units developed in this postgraduate course refers to mortgage mediation and the module on "Mediation and new technologies".



The screenshot shows the website for the Master's program. At the top, there is a navigation bar with links for 'Inicio', 'Contacto', 'Formación Postgrado', 'Área de CEPEP', 'Futuros estudiantes', and 'Conflictos / Temas'. Below this, the main heading reads 'La mediación: estrategias y metodologías de prevención y resolución de conflictos, II Edición.' A left-hand menu lists various sections like 'Datos generales', 'Objetivos', 'Información Académica', 'Profesorado', 'Horario', 'Prácticas Externas', 'Perfil de Acceso', 'Prescripciones y matrícula', 'Precios y tasas', 'Compromiso de Calidad', 'Novedades', 'FAQ', and 'Contacto'. The main content area is titled 'Datos generales' and provides key information: 'Título: Master (Título Propio) / Diploma de Estudios Universitarios', 'Modalidad: Sempresencial', 'Tipo de enseñanza: Título Propio', 'Precio: Mínimo 10 - Máximo 15', 'Precio: 995,00 €', 'Créditos: 60', 'Lengua(s) Utilizada(s): Castellano', 'Duración: Del 6 de septiembre de 2017 al 17 de mayo de 2018', 'Créditos: 60 Creditos ECTS', 'Prácticas en empresa: SI', 'Rama del conocimiento: Ciencias sociales y jurídicas', and 'Centro donde se imparte: Universidad Pablo de Olavide'. There is also a 'Presentación' section with a small text block and a 'Campus Virtual' button.

Figure 1. Virtual space of Mediation Master: strategies and methodologies for conflict prevention and resolution.

Regarding the contents of the Master's Degree, they are specified in the following training modules: (1) concept, legislation and general aspects of mediation; (2) Phases, methods and techniques in mediation; (3) Preparation of social projects in mediation; (4) Psychological and social aspects of interpersonal conflict; (5) Employability in mediation. Mediating entities; (6) Mediation as a family conflict management system; (7) Intercultural mediation; (8) Mortgage mediation; (9) Community mediation; (10) Legal and economic aspects of family conflicts and (11) Mediation and new technologies.

Finally, there is the last module: Final Project and Practices, constituted by the End of Master Project and the practices in City Council, Seville Provincial Council and Mediation Entities.

Regarding mediation in conflicts is not a modern invention; In all cultures there have been men and women who used mediation to solve the problems that existed between people. This nonviolent strategy is establishing itself as a good instrument to solve some conflicts in fields related to law, consumption, education, marital separations, and neighborhood disputes, international conflicts, etc. (De Prada and López-Gil, 2008).

The ten principles of mediation developed by Munné and MacCragh (2006), in agreement with Iglesias (2013) can be considered as the philosophy of mediation, so they must be present in any mediation scenario, regardless of their context of intervention:

1. The humility of admitting that external help is often needed to solve one's own difficulties.
2. The responsibility of the acts themselves and their consequences.
3. The search for one's own desires, needs and values. Respect for oneself
4. Respect for others the understanding of the other's desires, needs and values.
5. The need for privacy in difficult times.
6. The recognition of moments of crisis and conflict as inherent to the person.
7. The understanding of suffering produced by conflicts.
8. The belief in one's own possibilities and those of the other.
9. The empowerment of creativity on a reality basis.
10. The ability to learn from critical moments. The bet on an advance that cannot always be through an uncomplicated path.

2. Research context and objectives

2.1 Context

In our case, the research describes a postgraduate experience with clouds of concepts about conceptions on mediation in a broad sense. The development of the same ideas may be considered as a continuation of the experience of innovative character that was developed initially during the academic course 2016-17. In this academic year, the innovative experience was developed with the intention of being able to contrast the results obtained, and assess the real relevance of the concepts already studied.

The postgraduate experience is framed in module XI: Mediation and New Technologies (Figure 2).

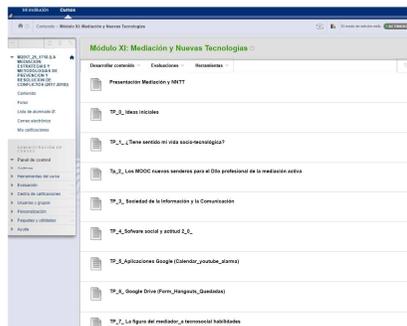


Figure 2. Organizational chart of the XI module: Mediation and New Technologies (extracted from the blackboard platform Learning UPO).

The educational research consisted of posing to the student an introspective reflection through clouds of concepts on the main aspects that characterize the concept of "mediation", with the social software WordArt /Tagul (Word Cloud ArtCreator) its link is: <https://wordart.com/> during the 2016-17 and 2017-18 courses. This social software allows one to design clouds of labels ("tag clouds") dynamically and easily from the concepts that are provided (López Meneses & Gómez Galán, 2010).

In the postgraduate experience, students must indicate the 4 or 5 concepts that are most relevant and significant to them in "Mediation" and in this way the acquisition of the concepts studied in the first formative module of the Master is also valued. Later, they sent the link of the cloud of concepts with a brief comment to the teacher's e-mail and a web space was designed << ad hoc >> to spread it with the free Jimdo application: <https://oyonuduceg.jimdo.com> that served as a repository for students to then make a reflective discussion of the different opinions expressed by the student body of previous courses. Also, a rubric was designed to assess e-activity (figure 3).



Curso 2017-18 Curso 2016-17 Rúbrica Contacto

Rúbrica de la e-actividad

CRITERIOS DE EVALUACION	VALOR
COMENTARIO	7 Puntos
<ul style="list-style-type: none"> La nube de palabras ayuda a la reflexión social y educativa Las comentarios personales sobre el concepto de "MEDIACION" son relevantes y significativos. El comentario crítico muestra un desarrollo lógico de las ideas y una argumentación sobrada. 	7
PRESENTACION: Word Clouds	3 puntos
<ul style="list-style-type: none"> Redacción clara y concisa Lexico amplio, adecuado, pertinente con una correcta utilización de las normas ortográficas y de puntuación. Usabilidad del entorno Word Clouds. 	3

Figure 3. E-activity assessment matrix. <https://oyonuduceg.jimdo.com>

In relation to the word cloud studied in class, I explain briefly the reason of the selected concepts. Conflict resolution because mediation itself is a process of conflict resolution; extrajudicial because it is a process foreign to the judicial system that precisely seeks to avoid this path or even stop it if it has already begun; communication because it is the way through which the process is carried out and sometimes it is even restored when the communication is broken between the parties at the beginning of the process; Y agreement because although it is not always reached, the ideal in a mediation is that the parties reach a mutual agreement Word cloud link: <https://wordart.com/8zv6ymar8lox/word-art-2>

Next, it shows the didactic intentions, the development of the research and the most relevant results achieved during the development of the two academic courses in the Master of Mediation: strategies and methodologies of prevention and resolution of conflicts

2.2 Objectives

The main objectives of the innovative experience carried out were the following: (1) Personal reflection on the conception of mediation; (2) Stimulate the active role of postgraduate students in the process of knowledge construction; (3) Encourage digital learning; (4) Encourage the use of social software; (5) Design a repository of concepts about "Mediation".

The priority objective that was sought with this diachronic investigation over two academic years (2016-17 and 2017-18) was to assess the prevalence of the concepts of "Mediation" incorporated into the repository throughout the period of the time studied.

3. Methodology

The methodology of the investigation was qualitative and descriptive. The sample consisted of a total of 20 students of the Master's Degree in Mediation: strategies and methodologies for prevention and resolution of conflicts at the Pablo de Olavide University in Seville for the academic courses 2016/17 and 2017-2018.

For the present analytical study, the contributions made by the student group were approached by analyzing the words, or sets of meanings, as units of registration. Subsequently, the guidelines established by different authors (Bogdan and Biklen, 1992, Miles and Huberman, 1994 and Monje, 2011; López Meneses, Gómez Galán and Vázquez Cano, 2016; López Meneses, Cobos and Gómez Galán, 2016) were taken as a frame of reference. Specifically, in an initial phase the data was reduced by categorizing and coding the information obtained. The categorization involved simplifying and selecting the information to make it more manageable. For this we follow the following steps: (1) Separation of units to identify significant segments of

information on the reflections formulated on the concept of Mediation; (2) Identification and classification of the units to gather them conceptually in groups that shared the same topical meaning; (3) Synthesis and grouping of the different information units.

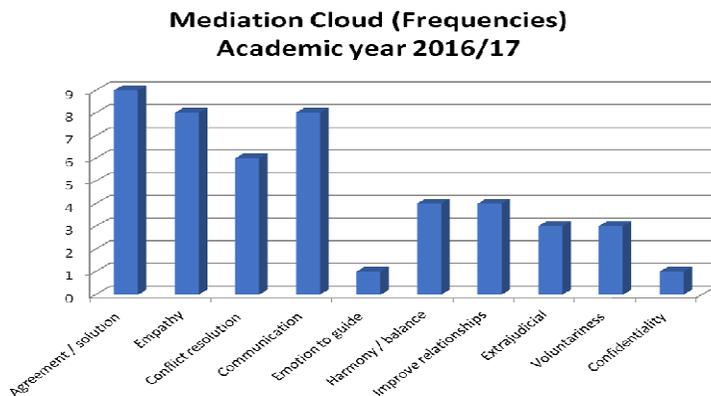
During coding each textual unit was identified with its category through a mixed procedure (inductive-deductive) to proceed next to its frequency count and percentages. Ultimately, the various categorized information units were analyzed to facilitate the phase of inference and interpretation of the results that is set out below.

3. Results

The students of the Master of Mediation: strategies and methodologies of prevention and conflict resolution of the Pablo de Olavide University, in the two academic years (2016-18), were fulfilling in a satisfactory way the objectives set in the study, reflecting in the clouds of words what they understood as the meaning of the concept of "Mediation" based on their introspective reflection on the conception of old age and on active aging. On the other hand, the methodology developed has encouraged at all times the active and autonomous role of students in the process of knowledge construction, achieving multimodal learning among students and the use of social software. Finally, a collective repository of previous conceptions in relation to Mediation has been built. The link is: <https://oyonuduceg.jimdo.com/>

To present the results obtained throughout the diachronic study, we will first expose the results collected for each of the courses, to then make an assessment of those concepts that prevail over time.

Regarding the 2016-17 academic year, in Figure 1, the concepts associated with Mediation are expressed.

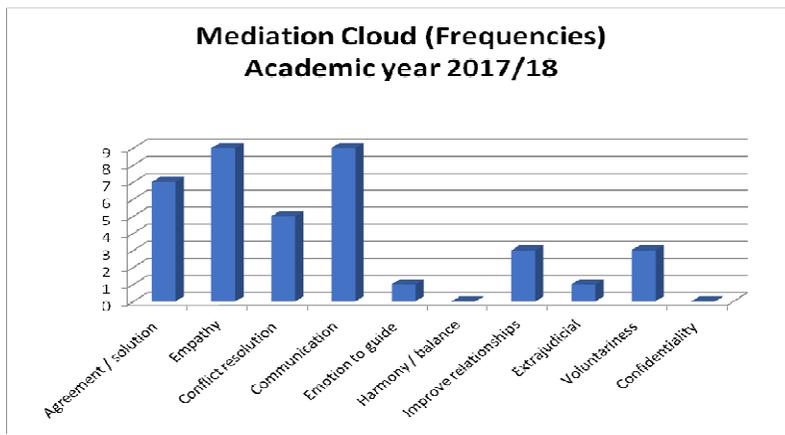


Graph 1. Frequency of responses of the students (2016/17 academic year).

In reference to the percentage analysis of the students of the Mediation Master: strategies and methodologies of prevention and resolution of conflicts corresponding to the academic year 2016/17 linked to the concept of Mediation are the following: Agreement / solution (19.15%); Empathy (17.02%); Conflict resolution (12.77%); Communication (17,02%); Emotion to guide (2.13%); Harmony / balance (8.51%); Improve relations (8.51%); Extrajudicial (6.38%); Voluntariness (6.38%); Confidentiality (2.13%).

In this sense, it can be seen in graph 1 that the most representative concept associated with mediation is the establishment of "Agreements / Solutions", with (19.15%), followed by "Empathy" and "Communication" (17.02%, respectively) and "Resolution of conflicts" (12.77%). On the other hand, with a lower percentage, "Improve relations" and "Harmony" stand out (8.51%, respectively). Finally, it is worth highlighting with less than 7%, the concepts of "Extrajudicial", "Voluntariness" and with less than 3%, the meanings: "Confidentiality" and "Emotion to guide".

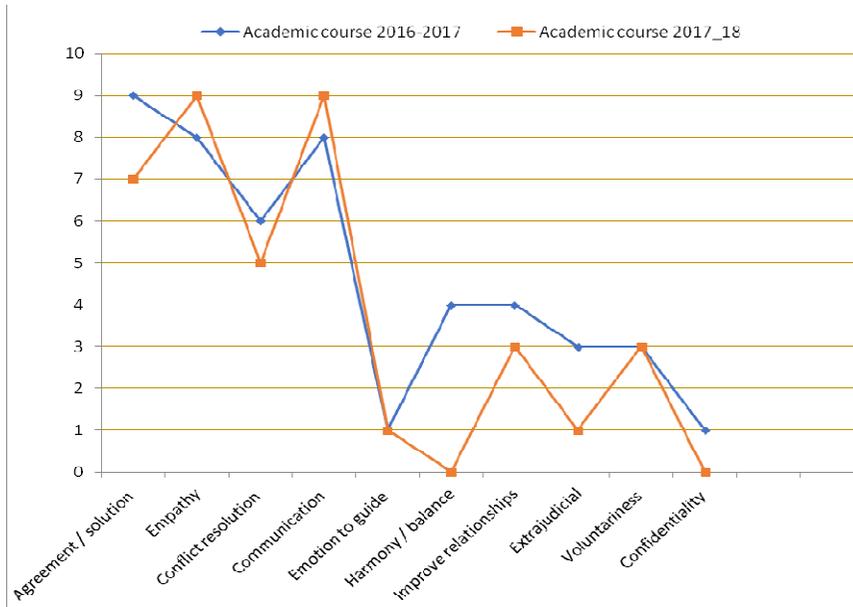
Once the perceptions of the students of the academic year 2016/17 have been described, Graph 2 shows the frequencies of the students' answers on the conceptions of Mediation of the academic year 2017/18.



Graph 2. Frequency of responses of the students (2017/18.academic year)

In reference to the percentage analysis of university students linked to the 2017/18 academic year, the perceptions related to the concept of "Mediation" are the following: "Communication" and "Empathy" (23.68%, respectively); Agreement / solution (18.42%); "Resolution of conflicts" (13.16%); with less than 8% highlight: "Improve relationships" (7.89%); "Voluntariness" (7.89%) and with just 3%: "Extrajudicial" and "Emotion to guide" (2.63%, respectively).

Once the results of the two academic years have been presented, the prevalence of the concepts on "Mediation" over time is shown, in order to observe its oscillation (Graph 3).



Graph 3. Comparison of the prevalence of concepts on student mediation of the academic courses 2016-2017 and 2017-18 of the Master's Degree in Mediation : strategies and methodologies for conflict prevention and resolution.

When making a comparison between the prevalence of the relevant concepts for the group of students, we observe a predominance of four concepts that stand out from the diachronic study: "Communication" (17,02%, course 2016/17 and 23,68% course 2017/18); "Empathy" (17,02%, course 2016/17 and 23,68% course 2017/18); "Agreement / Solution" (19.05%, course 2016/17 and 18.42% course 2017/18); and "Resolution of conflicts" (12.77%, course 2016/17 and 13.16% course 2017/18). With less than 9%, the concepts of "Improving Relationships", "Voluntariness" and "Extrajudicial" stand out in both academic years. Finally, it is noteworthy that only the concepts of "Harmony / Balance" and "Confidentiality" appear in the 2016-17 academic year.

4. Conclusions

Among the main conclusions that are obtained, it is worth mentioning that the objectives set out in the postgraduate experience: to reflect and analyze through clouds of concepts the meaning of "Mediation", and to

stimulate digital learning through the use of applications related to the social software, has been fully achieved, as can be seen in the work carried out by the postgraduate students in the virtual space <https://oyonuduceg.jimdo.com/>

It is also noteworthy that the group of students has linked the concept of mediation with aspects related to the "search for agreements, dialogues and conflict resolution" in agreement with other authors (Álvarez et al, 2002, Boqué, 2003, De Armas, 2003, Munné & Mac-Cragh, 2006, Iglesias, 2013; Sánchez, 2013, Dorado, 2014, Hinojosa, 2015) or with "communication" as indicated by Diez (2014) and Binaburo & Muñoz (2007). Or, linking mediation with processes of agreement and empathy (Ortega & Del Rey, 2004; Lane-Garon, 2005, Luz-Clara, 2018), improvement (Munné and MacCragh, 2006) and volunteers (De Diego & Guillén, 2010).

Ultimately, as indicated by Martín-González (2008), Torrego (2013 and 2017) and Pizarro (2018), there are numerous definitions of mediation but, in one way or another, they all affect the following key aspects: it is an instrument for managing and resolving conflicts; it is complementary to the jurisdictional path; its purpose is to achieve a peaceful exit between the parties; it is characterized by being a voluntary, confidential, cooperative and structured process in which a neutral third party intervenes that facilitates communication and the achievement of decisive agreements, restores the protagonism to people, enhancing their commitment and responsibility. And we add, thanks to the mediation processes, synergies are created and elaborated in favor of social cohesion for the sustainable development of global citizenship.

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