

## **A Thematic Study on Scientific Research Integrity and Commitment to Committee on Publication Ethics (COPE): Reality and Prospects for Northern Border University (NBU) Post Graduate Students**

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**ABSTRACT** The study of scientific research integrity, critical thought, standards of evaluating assumptions and commitment to COPE represents the third constituent of HIEPs: High Impact Educational Practices. It is a two-dimensional study that focuses on the relationship between integrity and the actual level of commitment to Code of Publication Ethics among the post graduate students in Northern Border University. This study commences with a brief investigation of the positive scientific research reality and exposes the role of COPE-based acquired skills to enhance students' research and scientific research skills in post graduate studies. By following a qualitative analysis methodology, post graduate students' research orientations are compiled, studied and interpreted. The findings of this study will contribute to increasing scientific research integrity and the scientific responsibility of all; and more importantly, this responsibility would be shared by students and supervisors who want to ethically carry out scientific research supervision to enhance integrity.

### **INTRODUCTION**

Research integrity is an issue of international interest and is looked upon as a crucial issue in scientific research. Every month, several cases of scholarly research misconduct emerge; all of them are related to plagiarism, scientific fraud and duplication (Shaw and Satakar 2017: 79). Readers and research funding institutions, as the main beneficiaries, always express the need to increase the trust in the outcomes, the values and the recommendations of scientific research. Therefore, researchers need to refine and protect their knowledge to ensure its originality and scholarly value. It is a shared responsibility that researchers worldwide are required to have a sincere coordination with their collaborators to avoid any type of engagement in research misconduct. Since the 1970s, the National Academy of Sciences, Engineering, and Medicine (NASEM) in

the United States, for example, has been playing a significant role in introducing research integrity and promoting understanding its ethics and strategies. NASEM's reports have addressed researchers, scientists, educational and research institutions and states' leaderships. In NASEM's 2017 report on integrity, norms, regulations, consequences of misconduct, responsibilities and good practices are summarized in 11 recommendations. Here are some of them:

*To better align the realities of research with its values and ideals, all stakeholders in the research enterprise—researchers, research institutions, research sponsors, journals, and societies - should significantly improve and update their practices and policies to respond to the threats to research integrity identified in this report. (NASEM 2017: 2)*

*Since research institutions play a central role in fostering research integrity and address-*

*ing current threats, they should maintain the highest standards for research conduct, going beyond simple compliance with federal regulations in undertaking research misconduct investigations and in other areas. (NASEM 2017: 2)*

*Societies and journals should develop clear disciplinary authorship standards. Standards should be based on the principle that those who have made a significant intellectual contribution are authors. (NASEM 2017: 3)*

*To avoid unproductive duplication of research and to permit effective judgments on the statistical significance of findings, researchers should routinely disclose all statistical tests carried out, including negative findings. (NASEM 2017: 3)*

*Researchers, research institutions, and research sponsors that participate in and support international collaborations should leverage these partnerships to foster research integrity through mutual learning and sharing of best practices, including collaborative international research on research integrity. (NASEM 2017: 4)*

Historically, research integrity has focussed on three main issues related to scientific and scholarly research; they are plagiarism, falsification and fabrication. These three issues are called “the three deadly sins” of scientific research (Bouter 2020: 2363). In several parts of the world, research integrity flourished as a reaction to these three misconducts. Research integrity was first addressed by Cicero in *On Obligations* when he gave remarks about the relationship between honourable actions and the advantageous actions and the conflict between both: “Wrongs are very often committed in the public sphere through choice of what is ostensibly useful, as when we perpetrated the destruction of Corinth” (Cicero 2008). His conclusion on similarity and fabrication of ideas of both actions: “the guidelines for the useful are the same as for the honourable...the honourable lies here, but the advantageous lies there” (Cicero 2008). However, in the recent years, scientific research scholar shifted their attention to similarity with much more focus on text rather than the idea in text.

Academic research is a professional and objective activity to get the truth, solve a problem or find an answer to questions. Such a need supports scientific research, makes something

clear, how it functions, and how it works or will work (Wilkinson 2019: 83). Therefore, a researcher shall put activity in a way it can provide an answer to a question or a solution to a problem. Research’s components, consists of many components, research history, methodology, data collection, results and discussions, and publications, result in important meaning which is reflected in different points of view. For example, setting research questions, answering these questions, and elaborating on the result enhance the quality of academic writing and education (Arcavi 2000: 160). Further, academic writing is a kind of students’ activity guided by supervisor to help them construct build up their ideas and knowledge and enhance their profession (Macfarlane et al. 2014: 352). Hence, scientific research skill is an indispensable skill that every student must acquire.

### **The Role of Supervision and the Context of NBU**

Supervision in scientific research and academic writing, including master and PhD theses, or educational courses, are to assist researchers improve critical creativity thinking and professional skills, and gives a good contribution to scientific knowledge (for example, Anderson et al. 2006). Supervision in both requires skilful and trained supervisors. The quality of writing production depends on the supervision level and quality of supervisory style and students’ level (for example, Hemer 2012). Committed supervisors assist students to be critical, doubt issues and avoid hindering their students. Thwarting the supervisees/PG students results from the lack of following code of ethics and field experience, this is to say that unprofessional treatment of research students is critically against COPE and universal academic laws:

*Education researchers do not engage in discrimination in their work based on race; ethnicity; culture; national origin; gender; sexual orientation; gender identity; age; religion; language; disability .... or any other applicable basis proscribed by law... Education researchers who serve as teachers, trainers, or administrators of education and training programs perform their responsibilities conscientiously, competently, and with integrity (Donald et al. 2013: 624).*

Postgraduate students at Northern Border University have a good place in the debate on research integrity and commitment to code of ethics. NBU's postgraduate students are researchers and students. To find out how committed they are to research ethics and research policies in their research, the researchers conducted a two-dimension approach to assess how far they as "research trainees" adhere to research policies for integrity, novelty, truth and originality in postgraduate research. The researchers found consistency in following research ethics as they are all taught to avoid research misconduct, fabrications and inadequate details. Based on the researchers' observations, meetings and questionnaire, they found that the support policy for postgraduate research in Northern Border University is a consistent method to integrity that is maintained in all the levels of postgraduate programme. On what research integrity is, Shephard et al. (2015) argue that we need to guarantee that "academic misconduct does not occur amongst doctoral students and academic staff" (2015: 615). Godecharle et al. (2018), for example, look at institutional research integrity as "essentially a matter of the overall personal integrity of the researcher" which covers several elements like "the motives to start a research project, the adhered principles when conducting and publishing research, the data management, and the return to the community" (2018: 1430). These principles of truthfulness and honest are integrated part of research learning and reveal the PG students' commitment to academic integrity.

Several higher education institutions in the Saudi Arabia, Northern Border University included, follow good policies, helpful strategies and effective mechanisms designed to ensure that postgraduate students use acceptable principles of research integrity (Altwaiji 2017: 75). Though newly established postgraduate programme initiated the department of methodology in research; emphasising that integrity in research needs to be taught and that research ethics are part of the institutional duty and responsibility (Al Sawy and Altwaiji 2018: 145). This includes comprehensive policies, internal regulations related to academic integrity. In the context of how postgraduate students in NBU learn research integrity in their research and academic work, this study is related to how well the researchers and supervisors address commitment to research ethics.

Gallant (2008) defines integrity in scientific research as 'learning and teaching imperative' (2008: 49). In higher educational research institutions, research integrity situates this method within a wider context of academic and research pattern and therefore covers many related aspects of learning and teaching through which learners incorporate each facet of research integrity. In this part of the study, argument refers to teaching postgraduate students to become researchers to foster the terminology of research integrity; however, it is known that teaching how to conduct research is different from many types of academic teachings. The task of enhancing teaching how to research for reducing cheating is quite challenging: "the teaching and learning approach is a positive way forward because it employs strategies that are known to enhance learning, while at the same time reduce cheating" (Gallant 2008: 92). According to Gallant (2008), supervision or teaching how to research will help the researchers transform fabrication and cheating into a solid knowledge through which students develop deeper approaches to learning, improve their research motivation, and enhance their metacognitive skills.

Giving professional supervision is an ethical duty and a shared academic duty of supervisors who are professionally committed to assess their students' improvement, writing skills and academic behaviour (Löfström and Pyhälä 2018). Further, scholars should know the importance of understanding the different research environments, social differences, norms, and cultures and even have the ability to discuss issues with students in the early sessions. This is helpful in reducing the supervisees tension that they may go through and is looked upon as an important aspect for increasing the students' self-trust and their orientation toward their supervisors and the skill of academic writing (Kilian 2001: 70). As a result, good supervision results in professional supervision. This also ensures that scientific research misconduct does not happen in students' theses and scholarly articles.

### Research Questions

The major research questions that this study attempts to answer are:

1. To what extent can PG students adhere to the ethics of scientific research in their research?
2. To what extent are supervisors aware of postgraduate students' need for help to clarify the integrity of the research?
3. How to improve the research ethics rules for the skills of postgraduate students?
4. What is the role of the university in spreading the culture of research and publication?

### Literature Review

Much of the published works on research integrity, academic writing and research ethics focus on how researchers are trained, such as online training, 'traditional' or face-to-face training and, not the outcomes of the training. Gabriela (2017) said that academic writings are "required to have mechanisms for the recognition of the supervisory and mentoring roles. This implies that having clear definitions of the activities for supervising doctoral theses and guidelines for the promotion of good supervisory practices" (2017: 23). This means that assisting researchers implies having clear definitions of "the activities for supervising doctoral theses and guidelines for the promotion of good supervisory practices" (2017: 23). Gabriela (2017) emphasizes the importance of supervisors' conceptual models which draws the path that students shall improve. Gabriela highlights "the relevance of recognizing that supervisors perceive some of the experiences of the doctoral journey differently according to the position that they assume" (2017: 124). Gabriela's results emphasizes the importance of supervisors' influence own students' experience on research integrity and commitment to code of research ethics.

Other researchers focus on the ways and the means through which higher education institutions and their employees can reform the institution environment at campus to improve research integrity (Nadelson 2006). Some other researchers examine how their students show the ability to note such trainings and their effects on their behaviours (Plemmons et al. 2006). The major part of the contemporary work on research integrity focuses on training the researchers, rather than the types of instruction and tends to focus on qualitative approaches

like interviews with PG students (cf. Love and Simmons 1998). However, the other type of the work on integrity focuses on quantitative research, focusing on the role accepting codes of ethics by students and noting their importance in furthering their research and academic skills.

Research supervising, with reference to research integrity and academic writing, is one of the areas of great research potential. However, one of the major challenges, according to (Sambunjak et al. 2006), is that supervising is looked upon as an important part of higher education, and the importance of this aspect should be known among faculty members. To make it clear, when a faculty member does not consider supervising to be important and works to be a professional mentors, his supervising career would be weak and provide insufficient guidance (Calkins and Kelley 2005), and therefore, some institutional pressuring may inhibit some supervising practices. Higher education teachers should be careful about codes of ethics and avoid all acts tending to violate research codes. According to Weil (2001), defining a "good" supervisor is also challenging if we consider commitment to the ethics and, therefore, many studies have emphasized the importance of supervisors in the ethical training of PG students (Hollander 2001). It is to conclude this part that faculty members, mentors and supervisors are not only educating these students through norms, but also teaching them the disciplines of creativity and integrity in several fields, and informing the PG students of the different implicit rules and disciplines. Hence, *emphasis is added*, highlighting the importance of commitment to code of publication ethics, academic integrity and authorship is one of the main tasks of faculty supervisor.

### Aims of the Study

Improving PG students' research skills is highly significant as it provides them with the main requirement for producing knowledge. Therefore, this study, from a scientific perspective, aims to investigate how the research environment, commitment to code of ethics and supervisors' commitment influence the development of academic writing. Another aim of this study is to find out how the concept of COPE is followed by Northern Border University PG students. Additionally, this paper aims to demon-

strate how Northern Border University PG students can play a major role in enhancing qualitative scientific research production.

### Importance of the Study

This thematic study of on Scientific Research Integrity and Commitment to COPE on post graduate students at Northern Border University will encourage university students to investigate the importance of quality, commitment to ethics and exploring timely and up-to-date issues. The results of this study will help building scholar's skills through fostering the aforementioned norms. This study will result in bringing students' and researchers' attention to importance of quality in research, academic writing and scientific and critical investigation of contemporary issues. To conclude, providing the students with a complete material based on scientific research results will invite the focus of university students and researchers to the importance of quality in research, scientific data mining and professional use of data.

### METHODOLOGY

This study is a qualitative investigation based on the thematic analysis method. The analysis step in this study begins with combining data and ends with conclusion/ remarks and recommendation. Progress in the study informs the analytical basis of this investigation in relation to the theoretical perspectives from analytical aspect and methodological tools - using the thematic/content analysis methods. This approach of analysis using such a framework led to figuring out two significant themes. The first theme reflects a noted relationship between integrity in research and supervision in higher studies. The second theme reflects how supervision in higher studies is at danger.

### RESULTS AND DISCUSSION

Analysis of the data of the study is done using Statistical Package for Social Science (SPSS) for more accurate results. The most important statistical methods used in this study:

- The Cronbach Alpha coefficient for the stability test of the study instrument.

- Frequencies and percentages.
- The arithmetic mean and the standard deviation.
- Kolmogorov Smirnov normal distribution test.
- Wilcoxon non-parameterized test as an alternative to the parameterized t-test.

The following is an analysis of the most important findings:

### Validity and Reliability of the Study's Instrument

The apparent validity of the questionnaire was ascertained in its initial form by presenting it to several specialized arbitrators. The researchers asked the arbitrators to express an opinion on the extent of clarity of the wording of each paragraph of the study instrument and the suitability of the paragraph to measure what it was set for. The researchers also asked the arbitrators for advice to make any modifications to the wording of the phrases for more clarity or to add any new expressions to increase the questionnaire lucidity. The two researchers made the amendments agreed upon by the arbitrators through adding, deleting, or reformulating some paragraphs.

As for the stability of the instrument, it was ascertained by using the Cronbach Alpha coefficient, whose most important results are shown in Table 1.

The results in Table 1 showed that it is evident that all the stability coefficients are high, which indicates that the tool is stable and can be applied.

Based on the observations, meetings and questionnaire, the study found that the support policy for postgraduate research in Northern Border University is a consistent and educative approach to integrity maintained across the levels of postgraduate programme. The study is a call for Northern Border University authority to encourage both students and supervisors to encourage commitment to research integrity and originality. The most important research ethics taught at PG levels are meant to avoid research misconduct, fabrications and inadequate details (Ana et al. 2013). With reference to students and supervisors' commitment to integrity and originality, Gabriela (2017) refers to a few important points; firstly, educational institutions should

**Table 1: Cronbach alpha test result**

<i>The axes of the study</i>	<i>Number of items</i>	<i>Cronbach alpha coefficient</i>
Postgraduate students' commitment to scientific research ethics in their research.	7	0.82
Supervisors' awareness of postgraduate students' need for help to clarify the integrity of the research.	4	0.77
Improving research ethics for the skills of postgraduate students	5	0.71
The university's role in spreading the culture of research and publishing	8	0.86
The questionnaire in general	54	0.90

*Source:* \* The table is composed of primary data collected by the authors

consider the importance of conception, terms and actual practices of both students and supervisors (2017: 128). In line with this study, Gabriela further argues that it would be crucial to emphasize the concepts of 'supervision perceptions', awareness and how supervisors understand and address to students the academic writing throughout even writing the doctoral dissertations: "It is also necessary to focus on supervisor learning since some of this study's findings indicated that supervisors have difficulties with agency development, specifically when they must balance the varied supervisory activities with other professional practices and also with personal life" (2017: 129). In this study on commitment to research ethics, the statement 'Supervisors' awareness of postgraduate students' need for help to clarify the integrity of the research' on Cronbach alpha test that shows (0.71) which emphasizes the importance of the researchers' hypothesis on the role supervision; this result confirms Gabriela's results, too.

Hypothesis statement 'Postgraduate students' commitment to scientific research ethics in their research' on Cronbach alpha test (0.82) strongly emphasizes the students' awareness to commitment to ethics of research. According to Nadelson (2006), researchers should focus on the ways and the means through which educational institutions reform the institution environment at campus to improve research integrity (2006). Nadelson (2006) emphasizes the importance of "student academic honesty" and how honest can be improved if "student affairs professionals, or faculty members can do many things to foster student growth. Some key interventions are working collaboratively on policies, being role models, allowing time for self-reflec-

tion, and asking the bigger questions of life" (2006: 7). In line with Nadelson's study, this study finds that the university's role in spreading the culture of research and publishing (0.86) reflects the importance of educational institutions' role in developing PG students' mission for higher education.

### Characteristics of the Study Sample

In Table 2, the distribution of the sample shows that the percentage of females is higher than that of males, where the percentage of females reached 78.9 percent, while the percentage of males reached 21.1 percent. It is evident that the females are more serious about pursuing higher study. The female sample members who are less than 30 years accounted for 67.1 percent. This reflects that most of the sample members are fresh graduates who have kept up with modern technologies at the university and therefore their responses regarding the research will be more accurate. As for the years of study, the data in the Table shows that most of the sample members have their study years from two to three years. It also shows that most of the sample members may have obtained a bachelor's degree from Northern Border University.

This finding of the study here is in line with the assumptions of accountability theory regarding the distribution of sample variables according to demographic characteristics at the university. As evident in the data analysis, the findings show that the percentage of gendered distribution is in favour of female students at the university 78.9 percent compared to 21.1 for the male students. However, Besselaar and Sandström reach to a different finding from this study. According to Besselaar and Sandström (2016),

**Table 2: Distribution of sample variables according to demographic characteristics**

<i>Variable</i>	<i>Variable classes</i>	<i>Frequency</i>	<i>Percentage</i>
<i>Gender</i>	Male	16	21.1
	Female	60	78.9
	Total	76	100.0
<i>Age</i>	Less than 30 years old	51	67.1
	From 30 to less than 35 years old	14	18.4
	From 35 to less than 40 years old	10	13.2
	From 40 years and over	1	1.3
	Total	76	100.0
<i>Years of Study</i>	For less than 3 years	52	68.4
	From 3 to 4 years	12	15.8
	From 4 to 5 years	8	10.5
	5 years or more	4	5.3
	Total	76	100.0
<i>The University from where a Bachelor's Degree Obtained</i>	Northern borders	55	72.4
	Other	11	27.6
	Total	76	100.0

Source: \* The table is composed of primary data collected by the authors

”the performance gaps between male and female researchers since long been indicated, with men on average publishing more papers, and receiving more citations than female researchers”. In this study, it is clear that the female students are more serious about pursuing higher study. The female sample members who are less than 30 years accounted for 67.1 percent. This reflects that most of the sample members are fresh graduates who have kept up with modern technologies at the university and therefore their responses regarding the research will be more accurate.

The study examined the scientific research integrity, critical thought, standards of evaluating assumptions and commitment to COPE in Northern Border University as the third constituent of HIEPs: High Impact Educational Practices. This study sheds light on the relationship between research integrity and the actual level of commitment to Code of Publication Ethics among the post graduate students in Northern Border University. The findings of this study are expected to contribute to scientific research integrity and the scientific responsibility of all; and more importantly, this responsibility would be shared by students and supervisors who want to ethically carry out scientific research supervision to enhance integrity (Resnik et al. 2015).

### Results of the Study Questions

Before answering the research questions, the researchers tested the Colmogrove -Smirnov test

for normal distribution, which resulted in the data not being distributed normally. Therefore, the non-parameter Wilcoxon test was used, which is a suitable alternative to the single-sample t-test in case the conditions for using the t-test are not available. The test result is considered significant if the value of the significance level (Sig.) is less than the level of significance adopted in this study 0.05 and vice versa.

If the value of the mean is between 3-4 and the differences between this average and the hypothetical mean of the study which is 3 are significant, then this indicates the respondents' high approval of the item, while if the mean value is higher than 4 and the difference is significant, then this indicates the respondents' very high approval of the item. However, if the average value is between 2-3 and the difference between this average and the hypothetical average is significant, then this indicates the respondents' poor approval of the items. Similarly, when the arithmetic mean value is less than 2, this indicates a lack of agreement at all with the item.

In case the value of the arithmetic mean attended 3 or was higher or less than, and the difference between it and the hypothetical average was not significant, this indicates the respondents' average approval. The following are the most important results that the researchers reached:

The result of the first research question: To what extent can postgraduate students adhere to the ethics of scientific research in their research?

The most important results needed to answer this question are shown in Table 3.

The results shown in Table 3 proved that it is evident that the arithmetic averages of the respondents' answers to the paragraphs of this axis ranged between 3.55 and 4.30, that is between high and very high approval. Three items received a very high degree of agreement, while the remaining received high approval.

In general, the above discussion shows the extent to which postgraduate students adhere to the ethics of scientific research at Northern Border University, which shows the role of the university and members of the teaching body in developing the skills of graduate students to become equipped with high research skills and capabilities, enabling them to meet the requirements of professionalism and the needs of the Saudi labour market in line with the Kingdom's Vision 2030. The survey indicates that research should focus on postgraduate students' commitment to the ethics of scientific research. A review of the literature has shown that there is a need for competent researchers. The above results confirm the theory that public universities and research centres require from their students to have a combination of scientific honesty, accuracy and documentation. This result is compatible with Calkins and Kelley (2005) that educational institutions should "push for formal mentoring programs at institutions of higher

education" and help "students and junior faculty members succeed" (2005: 260).

The item "In their research, students seek to achieve scientific honesty and accuracy in transfer and documentation" came at the top with an arithmetic mean of 4.30. When the significance of the differences between this average and the hypothetical average of the study, which is 3, was tested, it was found to be statistically significant, as the value of the Wilcoxon test attended 7.288 with a significance level of 0.000 smaller than the level of significance adopted in this study. It is a positive indicator of the awareness of graduate students. Coming second is the item "Students use real data for their research gathered from the study community". As for the last range, it was represented by the item "I see that the students document their research scientifically and correctly", where its arithmetic mean was 3.55. This indicates the high approval of the respondents that the students document their research scientifically and correctly. The Wilcoxon test confirmed this result.

The general mean of the axis was 3.92, which is greater than 3 which is the hypothetical mean of the study. When the significance of the differences between them was tested using Wilcoxon Test, it was found to be statistically significant, as the Wilcoxon test value was 6.263 with a significance level of 0.000 smaller than the level of significance adopted in this study

**Table 3: Wilcoxon test of the significance of the differences between the mean of the respondents' answers about commitment to the ethics of scientific research.**

<i>The items</i>	<i>Mean</i>	<i>Standard deviation</i>	<i>Wilcoxon (Z-value)</i>	<i>Sig.</i>	<i>Degree of commitment</i>
In their research, students seek to achieve scientific honesty and accuracy in transfer and documentation.	4.30	0.6930	7.288	0.000	Very high
Students use real data for their research gathered from the study community.	4.09	0.8030	6.756	0.000	Very high
Students analyze study data without scientific changing or manipulating.	4.04	0.8860	6.342	0.000	Very high
Students possess scientific research skills and can participate in it.	3.84	0.8650	6.014	0.000	High
Students know scientific research strategy and its priorities.	3.80	0.8170	6.002	0.000	High
The student in previous studies goes back to the original studies and does not quote them from other researchers.	3.79	0.9840	5.307	0.000	High
I see that the students document their research scientifically and correctly.	3.55	0.9580	4.349	0.000	High
The general arithmetic mean of the axis	3.92	0.6040	<b>6.263</b>	0.000	High

*Source:* \* The table is composed of primary data collected by the authors

(0.05). This indicates that the degree of ability of postgraduate students at Northern Border University to adhere to the ethics of scientific research in their research was high, according to what the respondents said. This reflects the fact that the students follow the university’s policy with respect to code of ethics.

The result of the second research question: To what extent are supervisors aware of postgraduate students’ need for help to clarify the integrity of the research?

The most important results needed to answer this question are shown in Table 4.

As Table 4 displays, it is evident that all items about the supervisors’ awareness of postgraduate students’ need for help to clarify the integrity of the research have received a very high approval score, as all the significance levels of the Wilcoxon Test (sig.) are clearly smaller than the significance level used in this study 0.05.

This finding here is in line with the assumptions of accountability theory regarding the responsibility of the faculty members at the university as well as the awareness of supervisors of the need for graduate students to help clarify the integrity of the research. In compatibility with this study, Calkins and Kelley’s study (2005) suggests that faculty members are expected to foster awareness of commitment to research ethics within their students (2005). Calkins and Kelley note that supervisors refer to the point that the relationship between supervisors and PG students can improve both research and mentoring practices and of students (2005). It shows that faculty members can help graduate

students to improve their research and provide scientific support and advice to them through supervision as well as research discussion as the most effective method. Empirically, this result is compatible with Weil’s study (2001) that outlines the role of a supervisor “good supervisor is also challenging if the researchers consider commitment to the ethics and, therefore, many studies have emphasized the importance of supervisors in the ethical training of PG students” (2001: 144). The study concludes this part of discussion with emphasis that supervisors and mentors are not only educating PG students through traditional norms, but also teaching them the professional disciplines of creativity and integrity and informing them of the different implicit rules and disciplines.

The general arithmetic mean of the axis was 4.21, which is greater than 3 which is the hypothetical mean of the study. When the significance of the differences between them was tested using Wilcoxon Test, it was found to be statistically significant, as the Wilcoxon test value was 6.180 with a significance level of 0.000 smaller than the level of significance adopted in this study 0.05. This confirms that the score of the awareness of supervisors at Northern Border University of postgraduate students’ need for help to clarify the integrity of scientific research was very high according to the opinions of the respondents in the study sample. The result in this part reflects the fact that the university has adapted a policy of recruiting supervisors who are well-trained and have the ability to instill the ethics in the students.

**Table 4: Wilcoxon test for the significance of the differences between the averages of the respondents’ answers about the items of supervisors’ awareness of research ethics**

<i>The items</i>	<i>Mean</i>	<i>Standard deviation</i>	<i>Wilcoxon (Z-value)</i>	<i>Sig.</i>	<i>Degree of commitment</i>
Faculty members make a lot of effort to follow up and improve the quality of students’ scientific research.	4.33	.8850	6.869	0.000	Very high
Professors and teachers have good supervision skills for university theses.	4.24	0.814	7.038	0.000	Very high
Supervising professors scrutinize research discussions and university theses and judge them precisely and objectively.	4.14	0.8440	6.724	0.000	Very high
The supervising professors work to provide all means of support for students to conduct published scientific research.	4.14	1.016	6.153	0.000	Very high
The general mean of the axis	4.21	0.6860	<b>6.180</b>	<b>0.000</b>	Very high

Source: \* The table is composed of primary data collected by the authors

The result of the third research question: How to improve the research ethics rules for the skills of postgraduate students?

The most important results needed to answer this question are shown in Table 5. Findings in Table 5 showed that the means of the respondents' answers range from 4.18 to 3.67. That is between high and very high approval. Only two items received a very high degree of approval, while the remaining received a high approval.

Findings in Table 5 showed that the means of the respondents' answers range from 4.18 to 3.67. That is between high and very high approval. Only two items received a very high degree of approval, while the remaining received a high approval. According to the table results, the study sample reflects a very high agreement to values and ethics of integrity and the use of modern methods and technologies on Wilcoxon Z-value (7.425 and 7.242) respectively. Table 5 also shows that the mean in the third dimension "student's aspirations and expectations" security and identity protection" as a whole ( $M = 3.95$ ) came in the direction of agree, which indicates a high ascertain score of technological use in research. The results are compatible with Gabriela's results on the relationship between ethics and improvement and production of scientific research. According to Gabriela (2017), commitment to ethics and values contributes to

developing students' abilities and sharpen their critical approaches to research issues.

As for the general arithmetic mean of the axis, it reached 3.95 which is greater than 3 which is the hypothetical mean of the study. When the significance of the differences between them was tested using Wilcoxon test, it was found to be statistically significant, as the Wilcoxon test reached 6.394 with a level of significance 0.000 smaller than the level of significance adopted in this study 0.05. This indicates that the improvement of the rules of research ethics for the skills of postgraduate students is available to a high degree among graduate students at the Northern Border University, according to what the respondents reported. The result here reflects the fact that the university has given a good orientation for the postgraduate students on the issues of research ethics, plagiarism and publications through conducting workshops and trainings.

The result of the fourth research question: What is the role of the university in spreading the culture of research and publication?

The most important results needed to answer this question are shown in Table 6. As it is visualized in Table 6, the general arithmetic mean of the axis of the university's role in spreading research culture was 3.57, which is greater than 3, the hypothetical mean of the study. When the significance of the differences between them was tested using Wilcoxon Test, it was found to be

**Table 5: The results of the Wilcoxon test for the significance of differences between the averages of the respondents' answers about the items of "the extent to which the research ethics rules have improved the skills of postgraduate students" and the hypothetical mean of the study which is 3 arranged in descending order according to the arithmetic averages**

<i>The items</i>	<i>Mean</i>	<i>Standard deviation</i>	<i>Wilcoxon (Z-value)</i>	<i>Sig.</i>	<i>Degree of commitment</i>
Showing values and ethics of integrity in conducting and applying scientific research.	4.18	0.6470	7.425	0.000	Very high
Modern methods and technologies are used in carrying out research and scientific messages.	4.11	0.6850	7.242	0.000	Very high
Student scientific research meets their aspirations and expectations.	3.95	0.6710	7.028	0.000	High
The quality of research prepared by graduate studies students can be assessed as being of high quality.	3.86	0.706	6.584	0.000	High
Ensure to publish in scientific, local, and international journals with a strong influence.	3.67	0.9580	4.655	0.000	High
The general mean of the axis	3.95	0.5070	<b>6.394</b>	<b>0.000</b>	High

*Source:* \* The table is composed of primary data collected by the authors

statistically significant, as the Wilcoxon test value was 5.259 with a level of significance 0.000 smaller than the level of significance adopted in this study 0.05. This indicates that the Northern Border University has a high role in spreading the culture of research and publication.

The sample strongly agrees that human staff's competencies and capabilities to supervise scientific research at the university plays a role in fostering the ethics of scientific research ( $M = 4.24$ , standard deviation = 0.70 and Wilcoxon  $z$ -value = 7.23). This indicates a high ascertained score of the role of competencies of the supervisors. Observing the students' perception of staff's competencies, this offers future insights and amendment plans for institutions of higher studies (Lovitts 2008: 299). In line with the comment given by (Jiang et al. 2013), integrity in research is not same for all disciplines and areas of study, however, commitment to codes of research is crucial issue for PG students and supervisors in all higher education institutions. The sample's response to whether the university provides researchers with adequate support to conduct scientific research by covering its costs also represents the research sample opinions that the university's support is not suffi-

cient and does not provide the necessary support for researchers. Further, the sample's responses reflects the fact that the university should have good expenses on technology that support scientific research and adopt research projects that have a financial or investment return.

Looking at the respondents' answers about the items of this axis, the researchers' found that the item "human proficiencies/competencies and capabilities are available to supervise scientific research at the university" received a very high degree of approval with an average of 4.24. This means that the university has a very high role in providing competencies and capabilities to supervise scientific research. While five items received a high degree of approval, which indicates that the university's role in this (may mention the items) was high. The Wilcoxon test confirmed these results.

Two items of the axis achieved a moderate degree of approval, namely "the university adopts any research projects that have material or investment returns" and "the university provides the support in the appropriate way to conduct scientific research by covering its costs" with an arithmetic mean of 3.17 and 2.91, respectively. When the significance of the differences

**Table 6: The results of the Wilcoxon test for the significant differences between the averages of the respondents' answers about the items of "the university's role in disseminating research and publishing culture" and the mean of the hypothesis for the of the study which is 3 arranged in descending order according to the means**

<i>The items</i>	<i>Mean</i>	<i>Standard deviation</i>	<i>Wilcoxon (Z-value)</i>	<i>Sig.</i>	<i>Degree of commitment</i>
The university has the human staff / competencies and capabilities to supervise scientific research.	4.24	0.7090	7.230	0.000	Very high
The university is training graduate students on how to conduct scientific research.	3.99	0.9450	6.216	0.000	High
The university contributes to facilitating the researcher's task in case his research requires field visits to institutions related to the research.	3.64	1.080	4.264	0.000	High
The University supports students in creating peer-reviewed scientific journals to publish the research they are preparing.	3.62	1.006	4.394	0.000	High
The university encourages the transfer of students' research results to scientific reality, and their application.	3.58	0.997	4.238	0.000	High
The university provides a scientific aptitude examination service for student research to ensure its validity.	3.45	0.9990	3.268	0.001	
The university adopts any research projects that are material or investment.	3.17	0.9000	1.459	0.145	Medium
The university provides us with adequate support to conduct scientific research by covering its costs.	2.91	1.168	1.093	0.274	Medium
The general arithmetic mean of the axis	3.57	0.695	<b>5.259</b>	<b>0.000</b>	High

Source: \* The table is composed of primary data collected by the author

between them and the hypothetical mean of the study which is 3 were tested, using Wilcoxon test, it was found that the differences were numerical and not of statistical function. This is because the value of the significance level (Sig.), which reached respectively (0.145, 0.274), was greater than the level of significance adopted by the researchers in their study 0.05. This result means that the university's role in adopting any research projects that have a financial or investment return, as well as its role in providing financial support for researchers required to cover the costs of conducting scientific research was average according to the opinions of the respondents. The result in this part reflects the important role of the university in improving the research environment through annual funded projects.

### **Interviews**

In this part of the study, the researchers used interviews. The purpose behind the interview survey is to study the issues raised by the findings of the questionnaire survey. To this level, the results of the 10 interviews are explained in the following four sections:

#### ***1. Students' Commitment to the Ethics of Scientific Research***

The students who were interviewed were asked to respond to whether they were committed to the ethics of scientific research in their research. Students responded that they were committed to documenting and assigning the information to the source from which it was borrowed. Also, some of them attribute the information to the main source on the basis that s/he has personally viewed it.

#### ***2. The Role of Academic Supervisors***

As for the role of supervisors in explaining the integrity of scientific research to students, the students' responses were unanimous that the supervisors have a great role in knowing the integrity and ethics of scientific research. They responded that the supervisors are interested in the importance of the student's commitment to

the ethics of scientific research, especially when the student reaches the stage of the plan. When the student makes a mistake, s/he was alerted by the supervisor, as they were very keen on scientific honesty. The supervisor commented on each paragraph "from where did you get the paragraph and where the reference is?" Also, in each course, the supervisor deals with how to formulate references and how to quote verbatim.

#### ***3. Student Skills***

In this axis which is related to the extent to which the students' skills have developed in adhering to the ethics of scientific research, there was a clear development appeared through the students' responses. All of which focused on the development of students' skills in the research and documentation process, which had a great impact on the researchers' research. They have become more concerned with in-depth delve into the quote and search for the idea and formulate it in a good way. What confirms the increase in students' skills is the difference students noticed between preparing the initial plan for research and their skills today after the knowledge they acquired in addition to their knowledge of statistical analysis programs for data. This contributed to raising their awareness to understand and interpret the scientific results of their research.

#### ***4. The Role of the University***

As for the question about the university's role in spreading the culture of scientific research and publishing, students responded that the university was keen to involve them in educational courses and programs in how to prepare the teacher and some educational issues. Likewise, its role in discussing and taking their views on some joint projects with the government and private sector, in addition to providing them access for courses in the digital library, and to involve them in some scientific research.

Based on personal interviews with many students, the researchers' noted that the results of these interviews are consistent with the results of the questionnaire regarding all four axes. This indicates the existence of high integrity for scientific research at Northern Border University, both

concerning students' commitment to research ethics and to the role of academic supervisors in helping students. This is reflected in developing students' skills in adhering to the ethics of scientific research. The results also showed the role that Northern Border University plays in spreading the culture of research and publishing.

### CONCLUSION

The study of integrity in research, critical thought, standards of evaluating assumptions and commitment to COPE represents the third constituent of HIEPs: High Impact Educational Practices. The results of the study found that Northern Border University has a high role in spreading the culture of research and publication among postgraduate students. Based on personal interviews with many students and questionnaires, the study noted a high commitment to integrity in scientific research at Northern Border University among both students and supervisors. The results also indicated the crucial role of Northern Border University in spreading the culture of research and publishing; a good effort reflected in the improvement of students' skills within a short time span. Further, the study found consistency in following research ethics as they are all taught to avoid research misconduct, fabrications and inadequate details. Based on the observations, meetings and questionnaire, the study found that the support policy for postgraduate research in Northern Border University is a consistent and educative approach to integrity maintained across the levels of postgraduate programme.

### RECOMMENDATIONS

This study briefs the following recommendations:

- ◆ Fostering scientific research integrity is a crucial matter in the current and emerging context of PG studies.
- ◆ Promotion of research integrity and the implementation of research structures should address the best conduct and practice in all scientific disciplines as a canon for self-regulation.
- ◆ Academic guidelines should include a set of principles and priorities for NBU research community.

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