



Writing scientific thesis/dissertation in biology field: Deviation in introduction context writing

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Abstract:

Writing a scientific articles or thesis or dissertations has vital role to impart the ideas of the researcher to interesting audience and to enhance scientific communication. Postgraduate students in the field of biology in Iraqi Universities must write and present a thesis or a dissertation as a partial fulfilment of the requirements to obtain their MSc or PhD degrees. Introduction chapter, in these thesis or dissertation, must be written clearly and aims to justify the significance of the research working and to link the work to other previous research. Introduction writing process is getting growing problem as it shows differed styles of writing not in compatible with standard guidelines. Hence, this article aimed to focus on the studying the context style of introduction chapter in biological thesis or dissertations. The study included analysis of 124 thesis and dissertations, and interviewing 114 postgraduate students to discuss the introduction writing process. Introduction writing context was analyzed and evaluated according to the standard guidelines for scientific writing. The interview focused on scientific background, knowledge and approaches of student to how to write introduction. The results revealed that students showed significant defect and very poor knowledge in introduction context writing. Deviation from standard guidelines was noticed in all thesis and dissertations introduction writing criteria. All students claimed that they hadn't passed any syllabus concerning writing process, and their writing style depended on transferring or copying the styles of previous written thesis or dissertations even they were not correct. The study strongly recommends introducing specific syllabus for scientific research methods and scientific writing for postgraduate students before starting their thesis or dissertation writing.

Keywords: scientific writing, introduction, writing guidelines, thesis, dissertation.

كتابة الأطاريح والرسائل العلمية في حقل علوم الحياة: الانحراف في كتابة سياق المقدمة

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الخلاصة:

لكتابة المقالات والاطاريح والرسائل العلمية دور حيوي في نقل فكرة الباحث الى القراء ذوي الاهتمام ولتعزيز التبادل العلمي. يجب ان يقوم طلبة الدراسات العليا في حقل علوم الحياة في الجامعات العراقية بكتابة اطروحة او رسالة كجزء من متطلبات نيل شهادة الماجستير او الدكتوراه. احد فصول الاطروحة او الرسالة هو المقدمة الذي يجب ان يكتب بوضوح ويهدف الى تسويغ اهمية القيام بالبحث وربطه بالبحوث العلمية الاخرى. عملية كتابة المقدمة اصبحت مشكلة متنامية لانها صارت تكتب بطرق لا تتماشى مع المعايير القياسية. وعليه هدفت هذه الدراسة الى التركيز على نمط سياق فصل المقدمة في الاطاريح والرسائل لطلبة الدراسات العليا في مجال علوم الحياة. شملت هذه الدراسة تحليل 124 اطروحة ورسالة واجراء مقابلة مع 114 طالب دراسات عليا لمناقشة عملية كتابة المقدمة. تم تحليل محتوى المقدمة استنادا الى المعايير القياسية للكتابة العلمية. تركزت المقابلة على خلفية ومعرفة وطرق كتابة المقدمة للطلبة. كشفت النتائج ان الطلبة اظهروا نقص كبير ومعرفة رديئة بكتابة محتوى المقدمة. تم ملاحظة الانحراف عن المعايير القياسية في مقومات كتابة المقدمة في كل الاطاريح والرسائل. صرح كل الطلبة بانهم لم يتناولوا اي منهج يخص الكتابة العلمية واعتمدوا في كتابتهم على ما يستسخونه من الاطاريح والرسائل السابقة حتى ولو كانت غير صحيحة. توصي الدراسة بقوة ادخال مناهج متخصصة لطرق البحث العلمي والكتابة العلمية ضمن مناهج طلبة الدراسات العليا قبل شروعهم بكتابة اطاريحهم او رسائلهم.

Introduction:

A scientific research is an attempt to seek truth. The importance of research findings is not only demonstrated by themselves only but by publishing them to reach the readers. Information and knowledge cannot disseminate among populations without writing and distribute them to be available for interested people. Writing and publishing a research article is a successful way to convey the research findings from a researcher desk to a people table. As much the research articles or thesis are well written as they will be well accepted by the readers. Accordingly, the writing process for scientific article must follow special context that lead to make the article desirable, well understandable, effective and easy to be remembered. This must be considered strongly because as much article is accepted and understood as much it will be cited more in other journals or books and this is an important factor that researchers want to achieve (1).

Writing an article should follow standard guidelines for scientific writing. Accordingly, an article must involved introduction, methods, results, discussion, conclusions and recommendations (ILMRDC) (2, 3, 4, 5). The introduction part in a research article holds a great importance to make the article well acceptable or not. Hence high attention must be taken when the introduction means imparting the background, knowledge,

thoughts, rationale, objectives and approach of the researcher for the research philosophy. The prominent purpose of writing an introduction is to justify the significance of the research project in connections with previous works; introduction must represent the rational message for the research purpose. This can be achieved through using words in a manner in scientific writing that clearly impart the intended meaning of the researcher (6). Most standard guidelines have agreed to recommend specific context for introduction writing (7, 8, 9, 10, 11, 12, 13, 14). The introduction text is started with a broad context and then gradually narrowing down to key point and aim of a particular field of study, demonstrating the rationale of the research (15, 16, 17). The context of introduction can be represented by cone shape with two opened ends, the wide end in the top and narrow in the lower end, moreover, some authors demonstrated the introduction writing style as inverted pyramid, inverted triangle or a funnel (1, 17) to get closer picture for introduction context. The introduction writing purpose is mainly to justify the reason for doing the specific project. The main function of the introduction is to establish the clear context of the proposal being reported, it may involve three question marks "what" "why" "where" and "how" (can be represented as www.how)

to be asked when introduction is written. Each question mark needs to be well expressed by few accurate and focused sentences; what are the importance, problem and hypothesis of the research? Why this research is done? Where it can be performed? How this research will be carried out? Usually for seeking a grant to support a proposal, the sponsors need to be convinced by the researcher; therefore the researcher must give accurate, rationale, concise and well written introduction to get their agreement for that purpose (4, 18). Good introduction should start with demonstrating the importance of a problem to be solved, followed by brief history of what has been done worldwide with this problem by using relevant references. Then a researcher must demonstrate the possible approach to solve that problem firstly by other researchers followed by emphasizing the new ideas that the proposed research will suggest, and then the introduction ends with the key point of the research which is the aim of study. Hence the introduction should offer a road map with all the information to understand the rest of the proposal. This context shall illustrate an effective scientific introduction to give a good impression about the researcher scientific understanding, background and education in one hand and to explain the rationale of a research in another hand.

Iraqi postgraduate students, in the field of biology, usually write thesis or dissertations (TDs) as a partial fulfilment of the requirements to obtain their MSc or PhD degrees. They write their TDs following the same context as in scientific article but with more detailed text. These TDs must include abstract, introduction, literature review, methods, result, discussion, conclusion, recommendations and references chapters (2). Students must follow the guidelines and instructions of TDs writing published by the Ministry of Higher Education and Scientific Research which were adapted from well known standard guidelines for article writing.

However, most academic staffs, who involved in evaluation those TDs or who involved the postgraduates' examination committees, complain the frequent deviation in introduction writing process from the standard guidelines. This deviation reaches to a level where students sometimes bring introduction together with literature review in one chapter as they think there is no difference between both headings. This problem hasn't been discussed before; consequently, marked defects can be noticed in the introduction context in those TDS. Therefore if writing an introduction chapter in those TDs is not scientifically and contextually evaluated the defects will increasingly remain and this, consequently, make the rationale and the value of the proposal not clear leading to weaken the research purpose and message.

Methods:

Thesis and dissertation study

This study was carried out though two directions, the first included reading and studying 124 TDs of postgraduate students (both master and doctor of philosophy) in the field of biology (including medicine, dentistry, veterinary medicine, pharmacy, agriculture and biology). The second direction was making interviewing with 114 postgraduate students who finished their TDs writing. The study was performed in the Iraqi centre for cancer and medical genetics research for a period of five years (from 2007 to 2012).

The introduction section was read and analysed carefully and then criticised according to the most international used standard guidelines for scientific writing (7,8,9, 10, 11, 12, 13, 14, 15). To evaluate the introduction section, many criteria were assessed whether they were reported or not, these included:-

- Background to the subject area of interest.
- What is the problem?

- Why this research is proposed?
Importance of that problem?
- Relevant literature studies worldwide and locally.
- How the researcher deals with and approaches this problem?
- What is the new idea?
- Hypothesis
- Objectives

Interview study

Interviewing was done on 114 postgraduate students (master and PhD) from different departments and colleges as mentioned above. The interview was documented with only students who agreed to do this process and answer all questions.

The questions during the interview were as follow:-

- 1- Define the introduction section.
- 2- Why you are write introduction in your TDs?
- 3- Do you know the standard guideline for writing an introduction?
- 4- Have you known any idea about the main criteria involved in an introduction?
- 5- Have you ever read some articles about how to write an introduction?
- 6- What do you mean by introduction according to your own idea?
- 7- What is the rank can you give to the introduction among other chapters according to their importance?

Results:

Through the five years of this project performing, every TD of the 124 TDs was read and analysed carefully. The study concentrated on the writing context and style and excluded the grammar and linguistic errors. Every introduction was put under fine analysis to be evaluated through well known and acceptable standard guidelines for introduction writing. The evaluation sheets were grouped and classified according to similarity in their context. The results can be reported as followings:-

TDs results

1- Most TDs (105) wrote introduction section as a separated chapter while the others (19 TDs) put introduction and literature review chapters together in one chapter. Hence all the following results will be based on the 105 TDs.

2- Concerning the context of introduction writing, the results showed that 84 TDS were not compatible to introduction writing guidelines while the others 21 TDs were as a part of literature review.

3- The targeted problem was mentioned in 67 TDs and the other 38 TDs didn't refer to the problem.

4- The hypothesis was reported in only three TDs.

5- Literature citation was mentioned in all TDs but accompanied with wide variation in the number of references citation with range of 5-21. However, the TDs, with introduction and literature review as one chapter, were excluded in this case.

6- The aim of study was mentioned clearly in almost all TDs, however some of them the aim was not written clearly.

7- The sequences and arrangements of introduction context items were correct in 17 TDs while most of them (88) reported the sequenced them randomly.

8- The importance and justification of the project carrying out were mentioned in 51 TDs only. However the other 54 TDs didn't refer to the main reasons for doing the research.

9- Number of paragraphs per introduction ranged from two to 8.

10- The approach and the new idea of the researcher were documented in 32 TDs while the other TDS neglected this criterion.

11- The length of introduction was varied from one and a half page to five pages.

Interview result

1- All students were not able to give correct, accurate and complete definition

for introduction. Most of them claimed that introduction represented the summary of what they done. Others announced that it is summarized literature review while few of them gave different definitions apart of the real one.

2- Concerning the answering on the reasons to write introduction in TDs the results revealed that 32 students said the introduction is obligatory chapter to be written as it is a part of the TD requirements. Whereas 58 claimed as it is just a general review background about the research that to be performed, 17 students said it is a summary of what the researcher will do with the research methods. Only seven students gave acceptable but not fully correct answer.

3- All students confessed that they had no any information about standard guidelines for introduction writing.

4- All students were not able to list the main criteria or items involved in introduction context.

5- Only four students claimed that they had generally reviewed one or two articles about scientific writing while the others didn't do that.

6- The introduction meaning according to the students' thoughts was more or less like the answer of the first and second question. Most students said it is just a chapter might be written in TDs to inform others about the background of the research. Others said it is just a summarized literature review to give a brief history for specific subject. Very few students (seven) announced that introduction is for giving an idea about a research background and justification for doing that research.

7- All students couldn't give correct answer about the sequence of introduction criteria reporting. The answers were too variable that couldn't be classified into definite groups. However, most students were found to concentrate on the literature reviewing as firstly written while some others tended to write some basic

principles about the subject in the first. Moreover no one could list even some other criteria correctly.

8- The degree of importance of introduction, comparing with other TD chapter, was found to be varied through students answer. Most (89 students) claimed that it comes in third order after the results and discussion chapter. Others (21 students) said its order is the fourth after the result, discussion and literature review chapters. Only four students announced that it is the second after the results chapter.

Discussion:

This study was basically performed on 124 TDs from different disciplines in biology field, and concentrated on the writing style of the introduction context. The results revealed that 19 TDs had no separated introduction chapter but it was put together with the literature review chapter. Therefore those TDs were excluded from the study because there was means to evaluate the introduction writing style. Hence, all the following results were obtained through the study of the remaining 105 TDs. About 15% of the TDs involved in this study neglected the role of introduction section by adding it to the literature review chapter indicating that there is no difference between those both chapter in one hand and there is no significant importance for the introduction section in other hand. Each chapter has its function and role, therefore when the introduction section is integrated with literature review chapter, the reading process is getting difficult and the reader will find difficulty to know the policy, hypothesis, problem, approach and objectives of the research project. The introduction must be short and expresses itself clearly carrying all the requirements needed to tell the reader about the justification of doing that research (13,15). Whereas literature review chapter is specified to navigate the finding of other

related articles that done by others to give an idea about the situation of the specific problem in the world scientific media. Almost all scientific writing standard guidelines recommend putting the introduction in separated and well written chapter (13,15, 17). Moreover, Swales (19) discussed the development of article introduction writing style through many years to confirm the significance of introduction writing process in science dissemination. However, the new introduction offers a short narrative of how work in genre analysis has developed over the past years (20).

The results revealed that almost all the TDs didn't match the standard guidelines for introduction writing, 80% (84) of them didn't compatible these guidelines while (21) 20% were as part as literature review. These frustrating findings uncovered the ignorance of most postgraduate students in concern with scientific writing. This is confirmed by the answering of the students through their interviewing who certified that they hadn't encountered the standard guidelines for introduction writing. This problem was highlighted through the confessing of the students themselves; they failed to give right definition for the introduction, its function and its contents. It seems that those students wrote their TDs by following the style of the previous written TDs of other students. Consequently, the bias in the writing process will remain ads it is with the next TDs due to copying the same writing pattern. This dangerous conclusion mat lead to claim that even the evaluated TDs, that signed and certified by scientific examination committee, still possesses the defect in writing process. However, this is not strange because most students' supervisors now were graduated from the local Universities who used to write their TDs as it is now without paying high attention to the standard guidelines for writing. That means scientific writing style

transmitted from one generation to another even it was wrong as inherited pattern.

The target problem mentioning was noticed in about 64% (67) TDs while other 38% of them ignored to mention the problem that to be studied in the proposal. Moreover, it can be concluded from the students' answering that they had no obvious idea about what must be written in the introduction section. This is again representing a big problem in biology writing process; what will be expected from a researcher to accomplish without identifying the problem that needs to be solved? The philosophy of introduction writing was not clearly understood by most students, this was clearly demonstrated by studying their TDs and by their answering through the interview. Postgraduate student must well study the principles, guidelines and styles of scientific writing (5,21) before any start of TD writing. Prior to that the students must learn the philosophy and aim of scientific research firstly then they must know how to impart their thoughts and findings to the reader audience. The findings in this article revealed that almost all students were not able even to fulfil the main criteria of introduction writing such as hypothesis, researcher new approach, number of paragraphs, and length of an introduction, and even justification of research performing.

Concerning the hypothesis term, almost all students gave surprising feeling about the meaning of this term; they didn't make a difference between the term hypothesis and the term theory. Moreover the students, when they tried to discuss the meaning of hypothesis term during the interview, were thinking that it is a term related to mathematics, geometry or physics but not any scientific research writing needs.

In spite of the importance of justification of the significance of the subject, the results exhibited that less than a half of TDs mentioned that while more than a half of them neglected that. Absence of justifications my give bad imperative

picture about the concept of scientific research in students minds. That means students had no real reason to do their project, rather they just doing their research for obtaining their intended academic degree. Whatever is the research type, when written, the introduction must refer clearly to the justification for doing it. Almost all scientific articles confirm the presence of justification as an important and vital component of introduction section (4,13,15). The relevancy and sufficiency of literatures in the text of introduction was excluded in this study as it is difficult to judge that and it takes a lot of time to give reasonable analysis. Surprisingly, most students believed that introduction chapter is just routinely written as an obligatory or fixed chapter to fulfil the requirement of TD writing. Moreover some students thought that Introduction part is just a summary for literature review regardless of any other function for introduction writing.

Paragraphing process is another problem detected in TDs, although this study did not focus on the accuracy paragraph formation, the study just took a look on the number of paragraphs per one introduction. The number was varied between two to eight although the length of each paragraph was so varied but it was not taken in consideration in this study. Obviously the results revealed that the picture of paragraphing reflects the deficiency of students' knowledge in their writing ability on one hand and they didn't aware about the superfluous and verbosity that leading to flopping in writing context. Variation in the number of paragraph also leads to variation in the length of the introduction to fill one or more pages, which was clearly noticed among TDs. Some TDs showed introduction with more than five pages and some reached to eight pages. The strength and effectiveness of introduction usually lie on its succinctly, accuracy and rationality (15,22, 23).

The results, through TDs analysis and through interview, assured the inability of student to arrange the components of the introduction in proper order, which is first and which is the last criterion. Most of them wrote the introduction components almost in random orders rather than following the correct context; the sequence of contents in the introduction context of these TDs was almost completely absent. Almost all well known articles concerning scientific articles have documented standard instructions for introduction context writing (7,8, 9, 10, 11, 12, 13, 14, 15, 17). An introduction must involve many criteria written in consequent manner starting from broad area which represented by subject background, stating the problem, what is going on worldwide in the studied subject through literatures, and what the author's new approach for solving the problem, then the introduction ends with narrow area which can be illustrated by reporting the hypothesis and ends with the key point of the research, the aim. These consequently arranged items are main components of any introduction written for scientific articles including thesis or dissertations and every researcher must be familiar with these organized instructions in order to get well accepted, readable and successful article. It is clear that most students missed the truth that an introduction is written to summarize for the reading audience what is the specific problem before they do their experiments or studies. Although the problem of scientific writing was noticed in other non native English speakers from other countries (11,24, 25, 26, 27, 28, 29) but the problem here concerns writing style not grammar and linguistic errors.

The present research didn't focus on lexical, sentence structure and syntactic relationship errors because these are other matters need further and deep studies. The prominent problem appeared from the present study is intending of postgraduate students to write their TDs independent of

standard well known guidelines for introduction context. While, bearing in mind that, an introduction section needs high attention to be written precisely, carefully following well known defined instruction to give clear idea about the context of the work being reported. Generally scientific writing for TDs is not done to be criticized but in order mainly to improve precision of knowledge impart and to enhance communication. However, whatever a research is good it may be ignored if the scientific medium is unable to understand and accept the text in which a research is presented.

The ability to document the new approach of the researcher was not predominantly noticed in TDs. Only (32) 31% of these TDs mentioned that while the majority ignored that vital part. One of the most important role of introduction writing is to emphasize the new approach for solving the problems in concern, however it seems that postgraduate students either they didn't care about their new approach or they leave that to the reader to estimate that through reading the entire TD. Adding the new approach of the researcher in the introduction text will add new steps in progression and give the desired correct scientific communications.

In conclusion, this study uncovered the disappointing situation of introduction context writing process among Iraqi postgraduate students in the field of biological sciences. Analysis of TDs and the interview revealed that most students write the introduction section in their TDs according to what was written in previous written TDs regardless of the standard guidelines for introduction writing. The ignorance in scientific writing instructions may reach to the level of illiteracy. Courses in technical writing were suggested for students in different specialities to improve their ability to write scientific article in proper style (5,21,30). Therefore this study strongly recommends establishing well designed syllabus for

scientific writing style for all postgraduate students before they start writing their TDs. This syllabus can be performed by well known academic staffs that have a good experience in scientific writing process by following the standard international guidelines for scientific writing.

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