Teaching report writing in crop science to undergraduate agriculture students in a Nigerian University

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Abstract

In response to the urgent need for acquisition of technical writing skill by students, the Faculty of Agriculture, Obafemi Awolowo University, Ile-Ife, Nigeria introduced a one-semester course on Report Writing in Crop Science (coded CPP 408) to the fourth year of the 5-year Bachelor's degree curriculum in Agriculture. Whenever offered, the course was taught to a fairly large class (usually e"300 students), using *Content Analysis*, a research tool used to determine the presence of certain words or concepts within texts or sets of texts. The objective of this study was to evaluate the performance of the students in the course and its effectiveness on the students' performance in the compulsory final year research project (coded CPP 514) the students executed a year later. Students were assigned full-text research papers from journals and were guided into identifying and scoring on a standard scoring sheet the presence (1) or absence (0) of concepts expected in each section of technical papers. At the end of the semester, each student was assigned 25 papers from standard journals to score as done in class, statistically analyze the scores and write up the research in a technical journal format. Performance of the students in CPP 408 ranged from 20 to 63% with a mean of 41.3 ± 1.04 Their performance in CPP 514 was better, ranging from 45 to 75% with mean=66 ± 1.15. Performance in the two courses was positively correlated (r=0.48; r^2=0.23). study revealed that undergraduate students can be effectively taught technical report writing, using content analysis. Further refinements of this approach will likely improve skill acquisition of students for improvement in writing technical reports.

Key words: Content analysis, student research project report writing

Résumé

En réponse à la nécessité urgente pour l'acquisition de compétences techniques des rédactions par des étudiants, la Faculté d'Agriculture de l'Université Obafemi Awolowo, à Ile-Ife, au Nigéria, a présenté un cours d'un semestre sur la rédaction de rapports dans la Science de culture (codé CPP 408) pour la quatrième année du programme d'études de 5 ans de diplôme en agriculture. Chaque fois, le cours a été enseigné à une assez grande classe (généralement 300 étudiants), en utilisant l'analyse de contenu, un outil de recherche utilisé pour déterminer la présence de certains mots ou concepts dans les textes ou ensembles de textes. L'objectif de cette étude était d'évaluer la performance des élèves dans le cours et son efficacité sur la performance des élèves dans le projet de recherche de la dernière année obligatoire (codé RPC 514) que les étudiants devaient exécuter un an plus tard. Des documents de

recherche en texte intégral de revues ont été attribués aux étudiants. Ils ont été guidés dans l'identification et au marquage sur une feuille standard de notation de la présence (1) ou l'absence (0) de concepts prévus dans chaque section de documents techniques. À la fin du semestre, chaque élève a reçu 25 communications à partir des revues standard pour marquer comme fait en classe, analyser statistiquement les scores et écrire la recherche dans un format de revue technique. La performance des étudiants en CPP 408 variait de 20 à 63% avec une moyenne de 41,3 ± 1,04. Leur performance en CPP 514 était meilleur, allant de 45 à 75% avec une moyenne = 66 ± 1,15. Les performances dans les deux cours étaient positivement corrélée (r = 0,48; r^2 = 0,23). L'étude a révélé que les étudiants de premier cycle peuvent être efficacement enseignés les techniques de rédaction de rapports, en utilisant l'analyse de contenu. D'autres modifications de cette approche seront susceptibles d'améliorer l'acquisition des compétences des étudiants pour le renforcement de la rédaction de rapports techniques.

Background

The need to teach undergraduate Agriculture students the skill of technical report writing increases by the day. At Obafemi Awolowo University (OAU), Ile-Ife, Nigeria, Agriculture students in their penultimate year (the fourth year in the 5-year Bachelor's Degree Program) must register for and pass CPP 408 – *Report Writing in Crop Science*, a course offered in the Department of Crop Production & Protection (CPP). The expected outcome of the course is that the writing of the final year (fifth year) compulsory research project report (CPP 514) would be less burdensome and a pleasure for the students. Several approaches have been used to teach this course with little or no achievement of the goal. In recent years, however, *Content Analysis* has been used, but its effectiveness has not been evaluated. The objective of this study was to evaluate the effectiveness of CPP 408, taught using content analysis, on the students' performance in CPP 514. We tested the hypothesis Ho: students' performance in CPP 408, taught using content analysis approach, has no effect on their performance in CPP 514.

Literature summary

As noted by Lindsay (2012), there is a common saying about research; "if you haven't written it, you haven't done it." Unfortunately, technical report writing is one of the most inadequately developed of all the skills that scientists use in their research activity. Lindsay gave the following summary:

(i)   99% of scientists agree that writing papers is an integral part of their job (in Nigeria we refer to this as *publish or perish)*;
(ii) Fewer than 5% of researchers had any formal instruction in scientific writing as part of their training;
(iii) For most, the only learning experience they have is the example they get from the scientific literature that they read;

(iv) About 10% enjoy writing; the other 90% consider it a necessary chore.

Guided by this urgent need for acquisition of technical writing skill by students, the Faculty of Agriculture, Obafemi Awolowo University, Ile-Ife, Nigeria introduced a course into the 5-year Bachelor's degree curriculum in Agriculture, titled CPP 408 – *Report Writing in Crop Science*, a 400-Level course, open to graduate students. A search through the literature showed little or no published papers addressing training or teaching methods in technical writing skills specific to agriculture. Rather, emphasis has been on experimental designs, data analysis and interpretation, including use and misuse of statistics such as multiple comparisons (for example, Saville and Rowarth 2008). A recent study by Berzonsky and Richardson (2008) showed that undergraduates generally are deficient in information literacy. Although students favor using online scientific literature to address research questions, they often do not have the skills to assess the validity of research articles. In a 5-year study undergraduates taking a senior-level capstone plant sciences seminar were surveyed regarding their understanding of peer-reviewed literature. Surveys were administered at the beginning of the course and again after they completed the tutorials. The responses given on the surveys suggest that students lacked a firm understanding of what constitutes peer-reviewed scientific literature until after meeting with the librarian and participating in the tutorials. Before development of the partnership, undergraduates had difficulty finding and effectively utilizing online scientific resources. Berzonsky and Richardson (2008) concluded that introducing assignments related to information literacy throughout the curriculum should help teach important scientific literacy skills.

Content analysis is a research tool in the social sciences, especially in communication and documentation, used to determine the presence of certain words or concepts within texts or sets of texts. Researchers quantify and analyze the presence, meanings and relationships of such words and concepts, then make inferences about the messages within the texts. Babbie (2010) defined it as "the study of recorded human communications, such as books, websites, paintings and laws". In the humanities, content analysis is considered a scholarly method by which texts are studied as to authorship, authenticity, or meaning (Joubish and Khurram, 2011).

Study description

Each time CPP 408 was offered, the students (N e"300) were assigned ten full-text papers selected from several journals. In the 2012/2013 academic session, for example, papers were selected from *African Crop Science Journal*, *Crop Science*, and *Ife Journal of Agriculture*. The papers cut across several subject-matter areas of Crop Science – Genetics and Breeding, Physiology, Seed Science, Crop Protection, Farming Systems, etc. The papers were compartmentalized into manageable sections of typical scientific research writing; including Title, Abstract, Introduction, Materials and Methods, Results, Discussion, Conclusion and References. The different sections were then examined using the two basic methods of content analysis; that is, conceptual analysis and relational analysis, as appropriate. The students were taught the concepts to expect in each section, after which they sought through the papers for the presence or absence of each concept. As noted by Logsdon et al. (2013),

the *Abstract*, for example, should include sequentially statements of justification, objective(s), methodology, quantitative results, and conclusion along with recommendation, which is optional; all within the limits of the number of words specified by the *Guide to Authors* of the intended outlet (journal) for publishing the paper. The students were graded on their aggregate performance in continuous assessment, a final 1-hr comprehensive examination, a project report written as a scientific research paper, and a 1-hr examination on the project. For the project, the students were each assigned 25 journal papers to score for the presence (1) or absence (0) of the concepts. Data collected from the scoring of the 25 papers were subjected to statistical analysis of the student's choice and written up in the format of a journal article. The students' performance in CPP 408 was correlated with their score in the final year research project (CPP 514) done a year after CPP 408 and graded by several members of the academic staff in the Department. A 5-point grading system is used in the University, with e"70=A, 60-69=B, 50-59=C, 45-49=D, 40-44=E, <40=F.

Research   application

Performance of the students in CPP 408 ranged from 20 to 63% with a mean of 41.3±1.04, median of 41% and mode of 40%. Distribution of course grades was negatively skewed with 23% of the students scoring F, 70% had E and D while only about 7% scored C or B. No student scored A. Surprisingly, performance in CPP 514 was much better and different from that of CPP 408: range was 45 to 75% with mean=66±1.15, median=68% and mode=73%. The distribution was positively skewed; no student scored F, only 4.3% of them had E and D, 55.3% had C and B, and 40.4% scored A. Performance in CPP 408 had statistically significant positive correlation coefficients with the components of CPP 514 (Table 1).

Table 1.   Correlation coefficients between performance in CPP 408 and components of the performance in CPP 514 at Obafemi Awolowo University, Ile-Ife, Nigeria.

		CPP 514 components (%)			
	CPP 408	Seminar (60)	Write-up (25)	Attitude (15)	Total (100)
CPP 408	1.00	0.48**	0.45**	0.32**	0.48**
Seminar		1.00	0.37**	0.39**	0.88**
Write-up			1.00	0.58**	0.69**
Attitude				1.00	0.73**
Total score					1.00

** Significantly different from zero at 0.01 level of probability.

In conclusion, results of this study showed that students can be effectively taught technical report writing skills, using content analysis approach. The rather low, though statistically significant coefficient of determination (r^2=0.23), however, implies that the approach should be improved upon to give students better understanding and skill acquisition in writing technical reports.

Acknowledgement

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