Analytical essay writing: a new activity introduced to a traditional curriculum

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Komalage M. Analytical essay writing: a new activity introduced to a traditional curriculum. Adv Physiol Educ 36: 54–57, 2012; doi:10.1152/advan.00050.2011.—Medical students following a traditional curriculum get few opportunities to engage in activities such as a literature search, scientific writing, and active and collaborative learning. An analytical essay writing activity (AEWA) in physiology was introduced to first-year students. Each student prepared an essay incorporating new research findings with existing knowledge on a medical topic. Students were expected to study on the topic in detail from textbooks as well as from research publications and write a descriptive and critical analysis. This activity would help them to be aware of new developments in the field and understand the complexity and rapidity of changes in the subject. The aim of this study was to learn how students used the AEWA as a learning process. For this purpose, student perceptions were assessed quantitatively and those of the faculty staff were assessed qualitatively. The data from the students showed considerable achievements in the medical database search, scientific writing, group work, and search for new scientific knowledge. The activity was influenced by prior capabilities in computer use, English language knowledge, and writing ability. Resources available at the medical school had a greater influence on the activity. Faculty staff appreciated the quality of the essay while highlighting areas of improvement. The students seemed to be satisfied with the supervisory role of the faculty staff, whereas the staff felt that the students used the supervisors less than expected. The AEWA was a successful activity promoting many aspects of active and collaborative learning. The low availability of books and information and communications technology (ICT) resources, poor internet connection, and insufficient English language skills were probably responsible for the negative feedback on this activity in this resource-deprived environment.

Active learning components are becoming popular in the preclinical study period in medical schools (7). Some medical schools with traditional curricula are performing a significant amount of student-centered active teaching learning activities (11). Certain higher-order cognitive tasks, such as analysis, synthesis, and evaluation, are expected to improve with the active learning process. Many medical schools use student research projects as an optional or compulsory activity to improve research skills, analytic abilities, and critical-thinking and presentation skills (2–4, 9, 13). The participation of medical students in research is widely regarded as a valuable component of medical education and as a stimulus for the students’ future medical research career (15).

The curriculum in the medical school of the University of Ruhuna (Galle, Sri Lanka) is of the traditional type. During the first and second years, students study physiology together with anatomy and biochemistry. The teaching activities mainly consist of formal lectures, practical sessions, and tutorial classes. Project work leading to data collection was not feasible in the early phase of this traditional curriculum. Therefore, we introduced an analytical essay writing activity (AEWA) in which students are involved in a literature search, critical analyses of the subject, and scientific writing. The activity was conducted as a component of the physiology curriculum for first-year students. Students were expected to study on a given topic in detail from textbooks as well as from research papers and write a descriptive and critical analysis.

Students were assigned to groups according the alphabetic order of their names. Each group consisted of four students, and a supervisor was allocated to each group. Students were supposed to work together in finding information and to have discussions with supervisors. Topics were created by faculty staff and allocated to each group. However, each student had to write an individual essay. Topics were not limited to pure physiology but to broader subject areas in medicine. Some topics were clinically relevant. Each essay was expected to have 3,000–4,000 words. Several supportive lectures, demonstrations, and tutorial classes were conducted to guide the students. In these supportive activities, students were trained on the use of medical databases and electronic journals. They were guided on arranging the reference list, formatting word documents, and advised to avoid plagiarism. Faculty staff members supervised each student. The construction of the essay, relevance of the content, ability to understand the subject, analysis of information derived from the literature, and presentation ability were assessed as the essays were evaluated. Ten percent of the continuous assessment marks were allocated for this activity.

The aim of this study was to learn how the students used the AEWA as a learning process. For this purpose, student perceptions were assessed quantitatively and those of the faculty staff were assessed qualitatively.

METHODS

Student opinions about the activity were assessed using a questionnaire (shown in Table 1) 2 wk after the deadline for the submission of the essay. One hundred twenty-one students completed the activity and responded to the questionnaire. Only 1 student in the class of 122 students did not complete the activity and questionnaire. Student opinions were collected regarding several aspects of the activity. Students were asked to respond on a five-point Likert scale for given statements from strongly disagree to strongly agree. Those marked 4 and 5 (agree and strongly agree) were considered as positive opinions for the statement, whereas those marked 1 and 2 (disagree and strongly disagree) were considered as negative opinions to the statement. Those who marked 3 were considered neutral to the statement.

The opinions of the faculty staff members were also collected 2 wk after they completed assessing the essays. In-depth one-on-one interviews were conducted with five faculty staff members who supervised the activity and assessed the essays. Interviews were moderated by the author while an external person helped to record them. Staff members were invited to describe their experiences with the AEWA and were asked open-ended questions based on a short interview guide to initiate a discussion on different aspects of the AEWA. Both English
and Sinhala languages were used during the interviews. Sections in Sinhala were later translated into English by the author and checked by an external person.

Two external persons were involved in coding. Both of them coded all transcripts independently, read the material, and contributed in negotiating the final categories. Material about staff members’ experience with the AEWA was identified and used for systematic text condensation, according to the principles of Giorgi’s phenomenological analysis (1). The analysis followed four steps: 1) reading all the material to obtain an overall impression and selecting items that were relevant for the focus of the study, 2) identifying units of meaning representing different aspects of the staff’s experience and coding for these units, 3) condensing and summarizing the contents of each of the coded groups, and 4) generalizing descriptions and concepts concerning our research question of “How did the students use the AEWA as a learning method?”

This study was approved by the Ethics Committee of the Faculty of Medicine of the University of Ruhuna.

RESULTS

Quantitative Data From the Students

Several questions were included to assess the expected outcome, such as collaborative learning, new knowledge searching, and scientific writing. The results (Table 1) showed that students perceived considerable achievements in terms of the medical database search and scientific writing. Students seemed to have engaged in successful group work activities. Prior skills with computer use, English language knowledge, and writing ability had a minor influence on the activity. Resources available at the medical school had a greater influence on the activity. Students were considerably satisfied about the staff supervision.

A few limitations, such as the quality of the allocated topics, limited time allocation for the activity, and low interest and motivation, were identified by the students. Motivation for the activity seemed to be more assessment driven.

Qualitative Data From the Teachers

Three main themes, the quality of the essay, students’ commitment, and the use of supervisors, surfaced in the analysis of the qualitative data from the staff. Under the quality of the essay, three subthemes were identified: contents, use of language, and references.

Quality of the essay. CONTENT. Faculty staff were of the opinion that the content of the essay was more than average. However, they expected more clinically relevant information to be included in the essays considering the clinical relevance of the given topics. Students seemed to have difficulty in incorporating clinical aspects of the topic in the essay. The following are samples of comments by the staff:

Content can be considered generally more than average except in [a] few essays, however many areas are to be improved.

Most given topics have clinical relevance, but they pay relatively less attention to that.

The staff also mentioned that the content was too much in some essays, although there was less information from new research. Students extracted information mainly from text-

### Table 1. Student responses to given statements in the questionnaire

<table>
<thead>
<tr>
<th>Group work</th>
<th>Agreement</th>
<th>Neutral</th>
<th>Disagreement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group work made the activity easy</td>
<td>66</td>
<td>20</td>
<td>14</td>
</tr>
<tr>
<td>Group work was useful in the collection of information</td>
<td>70</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Our group worked together</td>
<td>50</td>
<td>31</td>
<td>19</td>
</tr>
<tr>
<td>Developments</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I learned to use medical databases like PubMed</td>
<td>81</td>
<td>8</td>
<td>11</td>
</tr>
<tr>
<td>I learned new things about scientific writing</td>
<td>85</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>I gathered new knowledge on the given topic</td>
<td>90</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>Influence of prior knowledge and skills</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My poor English language knowledge affected my performance on the essay negatively</td>
<td>32</td>
<td>26</td>
<td>42</td>
</tr>
<tr>
<td>My poor writing ability affected my performance on the essay negatively</td>
<td>32</td>
<td>27</td>
<td>41</td>
</tr>
<tr>
<td>My poor computer capability affected my performance on the essay negatively</td>
<td>24</td>
<td>28</td>
<td>48</td>
</tr>
<tr>
<td>Availability of resources</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>There were enough books in the library on my topic</td>
<td>45</td>
<td>19</td>
<td>36</td>
</tr>
<tr>
<td>There were enough computers available to students</td>
<td>29</td>
<td>19</td>
<td>52</td>
</tr>
<tr>
<td>There were enough computers with an internet connection available to students</td>
<td>17</td>
<td>16</td>
<td>67</td>
</tr>
<tr>
<td>The internet connection speed was good</td>
<td>26</td>
<td>20</td>
<td>54</td>
</tr>
<tr>
<td>Supervision</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advice from the supervisor was adequate</td>
<td>71</td>
<td>19</td>
<td>10</td>
</tr>
<tr>
<td>It was easy to contact and make an appointment with the supervisor</td>
<td>58</td>
<td>29</td>
<td>13</td>
</tr>
<tr>
<td>I was satisfied with the supervision</td>
<td>71</td>
<td>20</td>
<td>9</td>
</tr>
<tr>
<td>Supervision was helpful in the collection of information and writing the essay</td>
<td>66</td>
<td>22</td>
<td>12</td>
</tr>
<tr>
<td>Limitations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time was the limiting factor</td>
<td>62</td>
<td>14</td>
<td>24</td>
</tr>
<tr>
<td>I did the activity with interest because it carried marks</td>
<td>64</td>
<td>25</td>
<td>11</td>
</tr>
<tr>
<td>I did the activity with interest because I liked it</td>
<td>48</td>
<td>29</td>
<td>23</td>
</tr>
<tr>
<td>This activity was a waste of time</td>
<td>13</td>
<td>40</td>
<td>47</td>
</tr>
<tr>
<td>The assigned topic was too difficult</td>
<td>15</td>
<td>35</td>
<td>50</td>
</tr>
</tbody>
</table>

A five-point Likert scale was used to score the given statements from strongly disagree to strongly agree. Those marked 1 and 2 (disagree and strongly disagree) were considered as disagreement for the statement. Those who scored 3 were considered as neutral to the statement. Percentages of students who agreed, were neutral, and disagreed with each statement are shown.
books, and relatively less information was extracted from research publications.

Students included less content from new research and more from text books, probably they are not used to read research publications.

Many essays were poor in analytical aspects. Students summarized the information and paid relatively less attention in terms of analysis.

They have summarized the content in most essays than analyzing and synthesizing, which make low quality essays.

Regarding the constructive quality, faculty staff were of the view that the majority of the essays were acceptable. However, there was a high variation in the essays, ranging from very good to poor.

Very high variation about [the] constructive quality of essays from very good to very poor.

They need to develop the constructive ability since there was no flow in some essays, and content is fragmented.

USE OF LANGUAGE. Some students seemed to have difficulties in expressing ideas using their own words. The staff identified many problems in language use.

Many problem[s] in the usage of English language, language used is too simple and not good for scientific writing, but for lay person.

Students have difficulties with language (English). Although the activity is not to teach English, scientific writing should have correct English.

REFERENCES. The use of references and the construction of the reference list were the least developed areas in whole activity. Some important references were not included, and the reference list was not arranged in the expected format.

They have listed few references and the list is poorly prepared and formatted.

In many instances facts were presented without references.

Student’s commitment. Staff were of the opinion that the students’ performances were better than average. This activity seemed to place no extra burden on the students, although they started working late.

I think it is more than an average effort, however they started late. It seems that it is not a serious extra burden for them.

Use of supervisors. The motivation of the students to meet with the supervisors was initially low. Students contacted supervisors more during the later part of the activity. Some staff suggested that there should be a mechanism to require regular student-supervisor meetings, since students-supervisors contact was not satisfactory.

At the beginning, few students came to meet me, they were less interested or they did not start the activity, but later they came.

There should be a number of compulsory meetings with staff, since some students had poor contact with me which may affect the product (essay).

DISCUSSION

This study revealed evidence for the use of the AEWA as a new learning process by students. The improvement of skills in the medical literature search, scientific writing, acquiring new scientific knowledge, and group work are the main areas where achievements can be seen.

The ability to search the literature using medical databases is essential for scientists to learn new developments in medicine. This is an important activity for evidence-based medicine as well as case-based and problem-based learning for medical students (6, 8). Therefore, this training is helpful in any learning process, not only for medical undergraduate students but also in terms of continuous learning in their future professional life. Associated with this activity, we organized several practical demonstrations on the usage of medical databases and search functions since that is a main aspect we wanted to introduce through this activity. The results showed that students acquired skills in medical literature searches. The faculty staff mentioned that the content of the essays was more than average. However, they emphasized that more information should have been gathered from research publications.

Scientific writing is an important communication tool for a physician as well as for a researcher. Scientific writing was emphasized as an important training area in undergraduate medical education (10, 14) since it provides students with opportunities to develop their academic literacy skills, which may stimulate their future research career. The data from the students and faculty staff showed that the AEWA contributed to improvements in scientific writing skills.

The results showed that the students acquired new knowledge on a given topic. Students seemed to have learned in the given subject area not only through the collection of information but also through the process of analyzing and presenting the information. Analysis and presentation are much-appreciated qualities of active learning (11). However, the faculty staff expected the students to improve the analytical aspects of the essays further. This is the first such activity in this medical school. After students finish the AEWA, they will have studied for ~1 yr in medical school, which probably provided only limited time in which develop analytical and critical evaluation skills. Therefore, the students’ analytical and critical evaluation abilities may not developed up to faculty staff-expected levels.

The AEWA can help students to become aware of new developments in the field and understand the complexity and rapidity of changes that occur in the subject. Usually, medical undergraduates use textbooks for their studies. They understand the subject content with dogmatism. They do not understand the changing nature of science by referring only textbooks. However, content from scientific articles provides an opportunity for students to experience controversial issues of the subject and dynamic nature of that knowledge.

This activity promotes independent learning, a much appreciated aspect of lifelong learning skills (12). Medical students, especially in their first 2 yr of study, follow a teacher-centered learning process in a traditional curriculum that does not involve them in self-directed learning (16). However, the AEWA allows them to be independent regarding subject content, learning methods, and time allocation for learning. While being independent from teachers, this activity provided students with an opportunity to learn with colleagues as a group, which was successful according to the students’ opinions. Collaborative learning is accepted as an effective learning method that can improve teamwork, leadership, communication, organization, and time management abilities (5, 11).

This study shows the influence of prior knowledge on the AESA. Writing abilities, fluency in the English language, and computer literacy all had some influence on the activity.
According to the opinions of the staff, English language skills contributed toward the “quality” of the essay. Fluency in the English language varies among these undergraduate students, since English is a second language for almost all students, and they come from different social, cultural, and geographic backgrounds.

Poor availability of resources, such as books, computers, and internet connection, was highlighted as a drawback in this process. Adequate resources are required to achieve the expected benefits in this type of activity. This can be considered as a challenge in introducing such an activity in a resource-deprived medical school in a developing country.

Students seemed satisfied with the supervisory role of the faculty staff. We conducted several discussions to instruct the faculty staff about supervision, since this was a new activity for the faculty staff. However, the staff felt that the students contacted the supervisors less frequently than expected.

The faculty staff mentioned several areas of improvement for the activity. According to the faculty staff, the students gathered relatively more content from textbooks than from research publications. That may be due to the fact that the students were more familiar with textbooks than with research publications. The poor availability of resources such as full-text journal articles, poor internet connection, and poor ICT skills may have contributed to less content coming from publications. Other deficient areas according to the staff were the reference list and constructive and analytical aspects of the essay. It may seem as though the faculty staff emphasized more negative aspects and criticized the essays. Since faculty staff, as supervisors, want to see a better product, they are probably more critical and thus highlighted areas to be improved.

In conclusion, the AEWA promoted skills in information searches, scientific writing, and active and collaborative learning. The faculty staff suggested a few aspects to be improved in the activity. The low availability of books, ICT resources, poor internet connection, and English language skills are probably responsible for the negative attitudes toward this activity in this resource-deprived environment.

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DISCLOSURES
No conflicts of interest, financial or otherwise, are declared by the author(s).

AUTHOR CONTRIBUTIONS
M.K. conception and design of research; M.K. performed experiments; M.K. analyzed data; M.K. interpreted results of experiments; M.K. prepared figures; M.K. drafted manuscript; M.K. edited and revised manuscript; M.K. approved final version of manuscript.

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