

## Academic writing and integration of technology

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*Communication in a foreign language is already becoming a daily routine for many, personally, professionally and academically. Professional realization requires skills for writing documents such as biographies, cover letters, and correspondence, while in academic growth genres such as formal and informal communication, academic essay, article, abstract, and more are present.*

*Modern students are expected to take an active part in the classes, to read and process scientific literature, to prepare and present abstracts, to write coursework, to participate in poster sessions and conferences, i.e. they are presumed to have the necessary competences (linguistic and textual). But at university, in a real-world setting, students are confronted with a "foreign" language for many of them - a scientific language whose norms are only partially learned in high school and at the same time these scientific texts are in a foreign language - mainly English.*

**Keywords - Academic Writing, Blended Learning, Teaching English with Technology, Competence Approach**

*Академично писане и интегриране на технологиите (Мария Тодорова, Елена Колева). Общуването на чужд език вече е ежедневие за мнозина в личен, професионален и академичен план. Професионалната реализация изисква умения за създаване на документи като биографии, мотивационни писма и кореспонденция, докато в академичното израстване присъстват жанрове като формална и неформална комуникация, академично есе, статия, резюме и други.*

*Очаква се съвременните студенти да вземат активно участие в занятията, да четат и обработват научна литература, да подготвят и представят реферати, да пишат курсови работи, да участват в постерни сесии и конференции, т.е. приема се, че те притежават необходимите за успешно следване компетентности (езикова и текстова). Но в университета, в реалната учебна среда студентите се сблъскват с „чужд“ за голяма част от тях език – научния език, чийто норми са усвоени само отчасти в средното училище, а същевременно тези научни текстове са на чужд език – основно на английски език.*

**Ключови думи - Академично писане, смесено обучение, преподаване на английски език с технологии, компетентности подход**

### Introduction - competence approach

The pursuit of being relevant to current trends implies the transition of education from qualification to a competence approach.

The trend toward competence-oriented education is no longer only European but also global [1]. Since its emergence in the 1960s up to the present, the concept of "competence" has been widely interpreted and has been the subject of serious and in-depth research in various scientific fields. The individual's ability to present oneself effectively in different situations and contexts is linked to a dynamic complex of knowledge, skills, attitudes, values, and behavior.

Prof. K. Dimchev argues for a reorientation from a knowledge-centered approach to a competence approach [2]. This new, modern concept shifts the priority from factual knowledge to competence. This is an approach that focuses on educational outcomes, i.e. for a competence approach in language learning as well, which is expressed in the ability to respond and act in a variety of communicative situations.

The purpose of this article is to present the practical application of ICT for academic writing at UCTM. Modern students have grown up with technology but in order to be successful in the network environment of the network society, students

need to be able to control their learning, adjust and interpret information according to their personal needs. The application of ICT for academic purposes gives the learner a chance to become a more autonomous, motivated and responsible individual. This article is an attempt to explain how using different tools of ICT can help academic writing to be more effective for the students.

### Communicative competence and interactive training

Numerous studies confirm the need for interactive methods to be used in the implementation of competence-oriented training.

Mixing (Internet) technology in teaching is usually applied to a course where all students meet with a teacher in a classroom in attendance, but the course includes a parallel component for self-study, e.g., access to Internet-based materials. The technology of blending attendance and e-learning shows that if there is a connection between the content of the lesson and the e-learning materials involved, it will create enthusiasm among the learners. In blended learning, students can use their electronic devices even during attendance classes to successfully use Internet resources according to their needs. It is no exaggeration to say that blended learning can make the most of the attendance class as well as the internet technologies that can motivate students by introducing authentic classroom materials. However, the success of mixing involves the choice of technology and materials suitable for the course being taught.

The competence approach and interactive learning are complementary and when integrated, the required educational results are achieved. This co-operation promotes learning activities, "enhances the characteristics related to emotional intelligence" as part of professional competence, "develops thinking and promotes self-regulation of personality" [3]. In the context of language training, we are to discuss communicative competence. According to [4], the scope of communicative competence implies that not only the language code is essential but also what can be said, to whom; how to construct and how to interpret the discourse according to social roles and situations, knowledge and value orientations in communication or speech [4].

In sum, communicative competence and its constituent competencies can be represented as shown in Fig.1.

Linguistic competence means the ability to construct grammatically correct forms and syntactic constructions, as well as to understand semantic parts

of speech organized in accordance with existing rules in language and to use them in the sense in which they are used by the native speakers of the language. Linguistic competence or language competence is a major component of communicative competence. Without the knowledge of words and rules for the formation of grammatical forms and structuring of meaningful phrases, no verbal communication is possible.



Fig. 1. Schematic representation of communicative competence [5].

Sociolinguistic competence is a prerequisite for successful social realization. It is the ability to choose the right linguistic form depending on the communicative act: the situation, the communicative purpose, and intention of the speaker, the social and functional role of the participants in the communication.

Socio-cultural competence means awareness and knowledge of the national-cultural specificity of speech behavior of native speakers. Social competence is the willingness and ability to communicate with others. They are both represented as actional competence by [5].

Strategic competence is the ability and strategies to make up for some lack of language skills, as well as lack of speech and social experience.

Discourse competence refers to the ability to use certain strategies for the perception and construction of oral and written speech products (discourses), characterized by cohesion and coherence. These discourses are subject to the requirements of different genre forms. Discourse competence is the ability to: (1) to perceive information in discourse; (2) to create discourse.

Thus the construct in Fig.1. deliberately makes the discourse component central, i.e., places it where the

lexicogrammatical building blocks, the actional organizing skills of communicative intent, and the sociolinguistic context all come together and shape the discourse, which, in turn, also shapes each of them [5].

These five types of competences have separate dimensions, but they are part of a whole and it is communicative competence. As van Ek [6] calls them, they are "different aspects of the same concept." Undoubtedly, each of them has a connection with the rest. The central one is discourse competence, which is at the center of our investigation.

Knowledge of the language or linguistic competence is not sufficient to "understand and construct texts". Therefore, textual competence or discourse competence is not 'linguistic competence but competence to use language in a specific way'. The focus of our research is "textual competence", that is, the ability to read, understand, reflect, reproduce/reproduce and produce/produce texts according to their characteristics. Textual competence, in turn, forms the basis for the acquisition of scientific textual competence, which is an important prerequisite for successful academic study. Scientific textual competence is defined as the competence to use the language, i.e. as "competence in the use of cross-domain but also domain-specific" language [7]. In this sense, it is about mastering domain-specific expressions and constructions in order to read and create texts successfully.

### **Academic writing**

Although students have some experience of working with different text genres at school, the acquired text competencies are not sufficient to satisfy the requirements of the university. Many students find it difficult to take notes during lectures and seminars in a structured and clear manner, to participate in discussions, to read, understand and analyze/interpret specialized texts, to reflect on the reading and to process it.

Academic writing is completely different from writing in high school. It is equal to the acquisition of successful writing skills in the process of academic communication. The purpose of academic writing is to develop and improve the skills of students/doctoral students from different specializations and faculties for writing and editing texts of posters, reports, articles, diploma papers, dissertations, presentations, essays, etc. in Bulgarian and foreign languages.

The most common form of academic writing is essay writing. Essay writing requires the effective use of the language - appropriate vocabulary, adequate knowledge, good grammatical knowledge, as well as

the requirements for correct writing together with the appropriate writing format. A basic requirement for enhancing written communication skills is improving the ability to read and understand texts. Specialized literature (up-to-date articles) and databases are increasingly available.

However, what usually happens in practice is that essay writing skills are limited to routine topics and most of them are repeated annually. Students are able to guess the main or frequent topics, and in most cases, they are even instructed by their teachers to memorize some important topics or materials. This helps students remember the basics and get good grades in exams. However, their writing skills never really develop. This practice hinders students' ability to express their thoughts in writing effectively. It also damages their confidence when they cannot write what they have already learned or show the knowledge they possess. Teachers need to convey these strategies that help students improve their writing skills to express their ideas the way they think.

One of the main goals of learning a foreign language for academic purposes is to develop the ability to read and understand academic texts. Different types of reading are distinguished depending on the purpose of the activity. From a methodological point of view, it is essential to note the distinction between in-depth reading, also called detailed reading, in which all the information in the text is important to the reader, and selective, also called searching, scanning, orientation, or non-deep reading, i.e., reading which helps the student find a certain piece of information in the text.

Selective reading, which is characteristic of reading electronic texts, should play a leading role in the early stages of language learning when the language is not yet sufficiently proficient. With a higher level of proficiency as vocabulary and reading skills increase, profound reading provides better learning opportunities.

The second major objective of academic language training is to build and foster the ability to write. In English literature, the term academic writing encompasses the ability to create adequate texts in a variety of academic genres: from emails to a teacher or colleague, to the writing of a dissertation and a thesis.

The integration of modern technologies into foreign language learning as a result of the current trends in education is also reflected in their integration in academic writing [8] (as a subfield of foreign language training). Creating an academic text is a non-linear process that is usually described as consisting of

the following stages: idea generation, structuring, drafting, concretization, and evaluation [9]. The academic essay using the wide possibilities of the essay as a genre is both a tool to develop and evaluate the textual competence of the students and thus prepares them for writing the more serious research work and a larger volume of academic texts that students themselves have to create in their learning process.

For the purpose of the current investigation, students were taught to and were expected to:

- be able to identify the problem contained in the topic;
- be able to take a position on the issue;
- be able to express this position as a clearly and accurately formulated thesis;
- be able to defend this thesis in a reasonable manner by presenting a sufficient number of convincing arguments;
- be able to create a meaningful, coherent, argumentative text to show that they are proficient in the rules and capabilities of the language.

Similar investigations can be found in [10,11].

### Methodology

The study of skills building and the use of strategies for writing and correcting academic text using ICT has been done with the help of a specially adapted questionnaire containing 29 questions (Appendix 1). 13 students took part in the investigation of their discourse competence skills.

In order to complete the survey, respondents use a five-step assessment scale: Yes; Rather yes; Neither Yes or No; Rather not; No. In the inquiry, 13 valid questionnaires were collected for the purpose of the report. The assessment values are estimated according to the score correspondence table (Table 1).

**Table 1**

*Score correspondence table*

Answer	Yes	Rather Yes	Neither Yes, nor No	Rather No	No
Score	5	4	3	2	1

The stages of this study are:

1. Asking students to write an essay on a topic based on their background knowledge and school education. Analysis of their mistakes - structural, grammatical, lexical and other gaps. A further acquaintance of the students with the database, current articles and vocabulary in the field of their specialization with the help of ICT (scientific textual competence) and writing of 2 essays; (distance, self-

directed learning, tailored to individual psychophysiological conditions). Analysis and feedback on their mistakes - structural, grammatical, lexical, etc. gaps (language competence).

2. Introduction to strategies for improving academic writing and ICT use.

3. Rewriting an essay on a topic in their field of study (Organic Synthesis) and evaluation according to predefined criteria after familiarizing themselves with specialized dictionaries, a minimum of 3 articles in their scientific field and strategies for academic writing.

4. Comparisons and statistical data processing.

**Table 2**

*Results from the survey before and after the course, correlation coefficients*

	$\bar{x}_i$	$\bar{y}_i$	r	Sign.
q1	3.0769	4	0.4279	no
q2	3.6923	4	0.6967	yes
q3	3.7692	4.3077	0.6233	yes
q4	3.8462	4.2308	0.7841	yes
q5	3.3846	4.0769	0.8022	yes
q6	3.4615	4.2308	0.7359	yes
q7	4.384615	4.769231	0.433	no
q8	4	4.461538	0.7868	yes
q9	3.769231	4.307692	0.5471	no
q10	2.692308	3.538462	0.4726	no
q11	2.769231	3.461538	0.6947	yes
q12	3.307692	3.923077	0.7305	yes
q13	3.538462	4.307692	0.2166	no
q14	3.384615	4.076923	0.7554	yes
q15	3.461538	4	0.5578	yes
q16	3.769231	4.384615	0.2282	no
q17	4.076923	4.384615	0.6857	yes
q18	3.615385	4	0.3138	no
q19	3.692308	4.076923	0.8108	yes
q20	3.538462	4	0.8229	yes
q21	3.153846	3.615385	0.9363	yes
q22	3.615385	4.153846	0.9021	yes
q23	3.615385	4.230769	0.8199	yes
q24	3.923077	4.230769	0.8484	yes
q25	3.153846	3.692308	0.6396	yes
q26	3.307692	3.923077	0.7455	yes
q27	3.153846	3.846154	0.6207	yes
q28	3.230769	3.846154	0.6832	yes
q29	3.538462	4.153846	0.8733	yes

### Analysis of the results of the survey before and after the course

The results being discussed (Table 2) are from the initial analysis of the survey, consisting of 29 questions named “Self-assessment of English writing skills” (Appendix 1).

The means of the estimated assessment levels for all students before and after the training are presented by  $\bar{x}_i$  and  $\bar{y}_i$ . The correlation coefficient  $r$  is estimated by:

$$r_{xy} = \frac{\sum_{i=1}^n (x_i - \bar{x})(y_i - \bar{y})}{(n-1)s_x s_y},$$

where  $s_x$  and  $s_y$  are the corresponding standard deviations.

The correlation coefficients are tested for significance, by applying the t-test and criterion. Two classifications are considered here – by the difference of the means before and after the training (Fig.2) as well as by the correlation coefficient. These two classifications give a different point of view for the estimated skills.

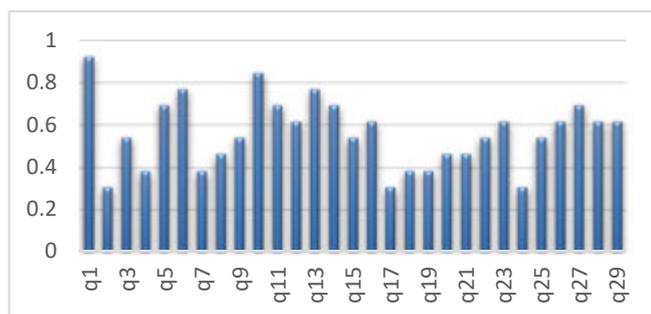


Fig. 2. Difference in mean assessment evaluation before and after the training for each skill (q1-q29).

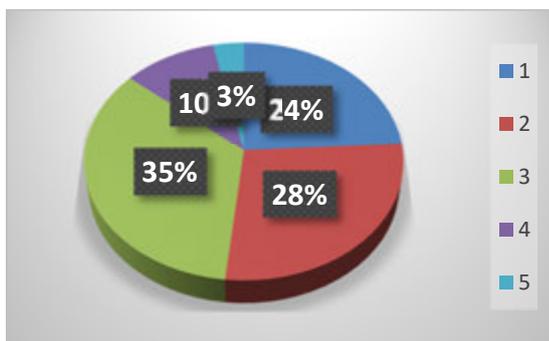


Fig. 3. Classification by the difference of the means before and after the training: 1 (q17, q24, q2, q4, q7, q18, q19): 0.3-0.399; 2 (q21, q8, q20, q15, q25, q9, q22, q3): 0.4-0.599; 3 (q12, q26, q28, q16, q23, q29, q5, q14, q27, q11): 0.6-0.699; 4 (q13, q6, q10): 0.7-0.899; 5 (q1): 0.9-1.00.

The first classification gives an idea about the overall mean improvement for each skill for all the

students. There is an improvement in all skills. The smallest is for q17 and is 0.3077 and the biggest is for q1 - 0.9231. All results are presented in Fig. 3.

The second classification by the correlation coefficient (Fig.4), calculated for each skill and considering the evaluation result for each student before and after the training, gives an idea about the individual improvement of each student, independently of his/her initial level of knowledge. A higher correlation coefficient means that more (or all) students showed an improved level of knowledge after training connected with the considered skill. So, the training was flexible and beneficial. On the contrary, if the correlation coefficient is low, some students may have improved the given skill but others did not show improvement; or the improvement of some of the students was too big compared to the other students. That is why such skills should be considered to be improved by more interesting and/or distributed according the students' capabilities tasks.

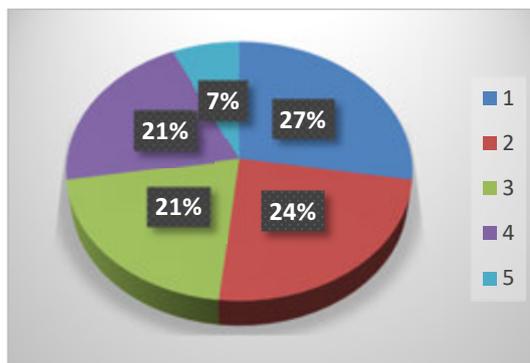


Fig. 4. Classification by the correlation coefficients of individual assessments before and after the training: 1 (q13, q16, q18, q1, q7, q10, q9, q15): below 0.599; 2 (q27, q3, q25, q28, q17, q11, q2): 0.6-0.699; 3 (q12, q6, q26, q14, q4, q8): 0.7-0.799; 4 (q5, q19, q23, q20, q24, q29): 0.8-0.899; 5 (q22, q21): 0.9-1.00.

1) Questions 21 and 22 are the questions with the highest correlation coefficient  $\geq 0.9$ . These are questions about worrying about writing an academic essay. Most students realize that writing an essay is not that complicated after learning about the format and writing strategies. It is just a task that needs to be accomplished to show their knowledge and attitude on a topic by using appropriate language and conventions.

2) For questions 5, 19, 20, 23, 24 and 29, the correlation coefficient is above 0.8. These are questions concerning the use of appropriate vocabulary - we take into account the improvement of students' self-esteem after reading texts purposefully in their scientific field and expressing attitude on a

topic in their scientific field. Students also declare that after taking the course it is not so difficult for them to edit what they have written, generate ideas, and use word processing programs.

3) For questions 4, 6, 8, 12 and 26, the coefficient is above 0.7. These are questions that take into account their real writing skills, namely writing paragraphs and organizing ideas within them; use of different sentences and writing styles; writing a summary of the information read; writing an introduction to an academic essay; knowledge of the format of the academic essay. Most of the investigated students improved these skills.

There are also results like that for skill q1, which show big improvement toward the difference of means and small correlation (Fig. 5). This result shows that there were students, who significantly improved their skills while others could not. The reasons for this should be further investigated.

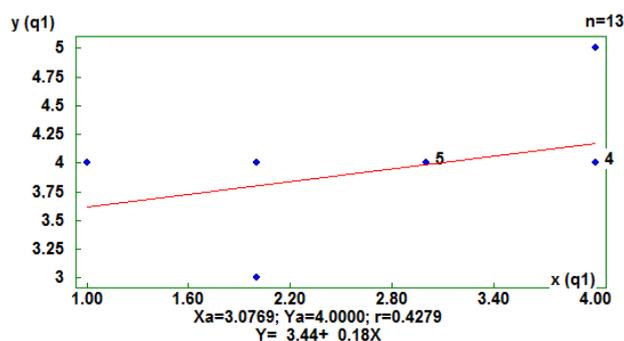


Fig. 5. Individual results for skill q1 – before and after the training. Numbers show repeated results from different students.

## Conclusions

The results of the survey can be summarized as follows:

1. Reducing grammatical, structural and lexical errors by individually tracking the gaps of the students enhances their linguistic competence, which is the basis for building textual competence.

2. Access to authentic and up-to-date materials in a foreign language (English) through the use of ICTs and databases that are beyond the content of a course helps to better understand and use different concepts and content in the specific scientific field of the students for a shorter period of time and more effectively (developing textual competence by purposefully keeping notes on current articles and enriching their vocabulary according to their needs).

3. Developing critical thinking in the process of writing that professionals describe as a combination of cognitive skills related to 1) interpretation, 2) analysis,

3) evaluation, 4) formulation of conclusions, 5) explanation and 6) self-regulation.

4. The course in Academic writing was beneficial and useful for students as it was expected but on an individual level, the results showed that the more prepared students took far more advantage of the course.

5. The academic essay using the wide possibilities of the essay as a genre is both a tool to develop and evaluate students' textual competence.

At the heart of the current debate on improving the quality of education is the issue of the acquisition of competences, which are essential both during the studies and for the professional realization. Scientific textual competence is one of the key competences in the academic field. Needless to say that (scientific) textual competence (for which linguistic competence is essential) can only be developed through intensive study of different types of text, which, on the one hand, makes it possible to become familiar with existing conventions and on the other encourages the acquisition of a science-specific vocabulary.

Scientific textual competence is one of the most important competences in the academic field. It plays an essential role in achieving success in university education and later for successful professional realization. Since the technology was integrated into the field of education, the approaches and methodology in teaching have changed rapidly. This article is an attempt to explain how using different tools of ICT can help academic writing to be more effective for the students.

## REFERENCES

- [1] Vatsov, S. Challenges to Competence Measurement, *Academic Journal of Management and Education*, Vol. 3, Volume 11, 2015, pp. 78-84. 2015
- [2] Dimchev, K. Linguomethodological and sociocultural aspects of language learning. // Dimchev, K. *Linguistics. Language education. Methods of language training*. Sofia: BULVEST 2000, 2010.
- [3] Nenova, S. *Emotional intelligence in economics training in vocational high schools*. Turnovo: Univ. ed. "St. St. Cyril and Methodius", 2005.
- [4] Boykova, F. Pragmatic Aspects of Communicative Competence, In: *Communicative Competence in Contemporary Scientific Discourse*, Collection in honor of the 70th anniversary of Prof. Kiril Dimchev. Sofia: Bulvest 2000, 92-96, 2005.
- [5] Celce-Murcia, Dornyei and Thurrell. *A Pedagogical Framework for Communicative Competence: Content Specifications and Guidelines for Communicative*

Language Teaching, Deseret Language and Linguistic Society Symposium, 19 (1), 1995.

[6] Van Ek, J. Objectives for Foreign Language Learning. Strasbourg: Council of Europe, 1986.

[7] Mitkova, N., Textual Competence in Academic Work, NBU, ISSN 1313-7875, Yearbook of Germanic and Romanistic Studies, 2016.

[8] Klimova, B. F. Making academic writing real with ICT, Procedia Computer Science 3 (2011) 133–137, 2011.

[9] Kremenska, A. VEHICCLE: A Model of Web-based Language Learning, Sofia, ACMBUL, IV. 2008.

[10] Klimova, B. F. Making academic writing real with ICT, Procedia Computer Science 3 (2011) 133–137, 2011.

[11] Akhtar, R., Asghar, T., Diffusing ICT to Enhance Students' Academic writing Skills, International journal of english and education, 4(3), 2015.

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## Appendix 1

### Self-assessment of academic English writing skills

Questions:	Before the course					After the course				
1. I am familiar with academic writing - genres, style, register.	1	2	3	4	5	1	2	3	4	5
2. I am able to write introductory sentences that fit the topic.	1	2	3	4	5	1	2	3	4	5
3. I can logically organize my ideas when writing a new paragraph.	1	2	3	4	5	1	2	3	4	5
4. I can logically support and develop my ideas when I write a new paragraph.	1	2	3	4	5	1	2	3	4	5
5. I can use the right vocabulary to communicate effectively with the reader.	1	2	3	4	5	1	2	3	4	5
6. I can use different sentence structures.	1	2	3	4	5	1	2	3	4	5
7. I can use proper spelling, capital letters and punctuation.	1	2	3	4	5	1	2	3	4	5
8. It is not difficult for me to make a summary of the information I have read in English	1	2	3	4	5	1	2	3	4	5
9. It is not difficult for me to paraphrase the information I have read in English.	1	2	3	4	5	1	2	3	4	5
10. I can write a good academic research paper in my field of study because I am familiar with the principles of writing.	1	2	3	4	5	1	2	3	4	5
11. I can write a good academic scholarly article in my field as I have a good command of English and a rich vocabulary in the field.	1	2	3	4	5	1	2	3	4	5
12. I can write a good introduction to an essay in English.	1	2	3	4	5	1	2	3	4	5
13. I can use logical paragraph ordering to support and develop my thesis.	1	2	3	4	5	1	2	3	4	5
14. It is not difficult for me to logically support and develop the thesis with reflections and examples from my own experience.	1	2	3	4	5	1	2	3	4	5
15. I can logically support and develop my thesis with paraphrases, summaries and quotes.	1	2	3	4	5	1	2	3	4	5
16. If necessary, I can successfully conduct a library survey to find information that supports my ideas.	1	2	3	4	5	1	2	3	4	5

Questions:	Before the course					After the course				
17. If necessary, I can successfully use search engines and resources to find information to support my ideas.	1	2	3	4	5	1	2	3	4	5
18. I can write a good conclusion to an academic essay.	1	2	3	4	5	1	2	3	4	5
19. I can use a word processor to write and format my essays in English.	1	2	3	4	5	1	2	3	4	5
20. It is not difficult for me to generate ideas before I write.	1	2	3	4	5	1	2	3	4	5
21. I make notes when reading articles in my field of science in order to use them to support my writing ideas later.	1	2	3	4	5	1	2	3	4	5
22. I can logically organize my ideas before I start writing.	1	2	3	4	5	1	2	3	4	5
23. It is not difficult for me to edit and improve my own writing, to improve its structure and organization.	1	2	3	4	5	1	2	3	4	5
24. It is not difficult for me to edit what I write in order to improve text, grammar, punctuation and spelling.	1	2	3	4	5	1	2	3	4	5
25. I can write effectively with time limits.	1	2	3	4	5	1	2	3	4	5
26. I can handle writing tasks quickly because I am familiar with their format.	1	2	3	4	5	1	2	3	4	5
27. I can identify the problems in my writing assignment and figure out what needs to improve after writing the draft.	1	2	3	4	5	1	2	3	4	5
28. I am familiar with and can use appropriate strategies when writing.	1	2	3	4	5	1	2	3	4	5
29. When writing an academic essay, I rely on my own thinking and resourcefulness.	1	2	3	4	5	1	2	3	4	5