



ICT Competence in Second Language Acquisition

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Abstract

Nowadays ICT competence has become one of the issues that determines skills and knowledge learners should obligatory acquire as it plays a major role in knowledge generation, information extraction and text processing. Information extraction from English scientific and technical texts is a complicated process due to the presence of rhetorical elements belonging to other genres such as, for example, terms based on metaphoric meaning extension, metonymic proper names, and other stylistic devices. The challenges are also associated with decoding of meaning of intra-disciplinary and cross-disciplinary polysemic terms, as well as culture-specific items.

Taking into account the advancement of ICT in any field of knowledge, text processing tools are able to perform multiple functions, such as classifying texts according to genres and functions, distinguishing polysemic items, as well as interpreting different models of meaning extension. But, at the same time, the ability of computer to search for the inquired information depends on the ability of the human operator to perform cognitive analysis, set the criteria, frame the content, and thus predict the results.

The present paper aims to identify the main aspects of ICT competence in second language acquisition, in general, and in teaching academic (research) writing, in particular. To improve written communication skills, it is necessary to develop learners' conscious understanding of conventions of academic text creation and language resources, which should be used to convey the intended message.

At present, to be proficient in academic writing has become even a more challenging task due to the constantly growing volume of information, the intertextual character and multimodal nature of a modern LSP text. In relation to the second language teaching, academic writing is seen as a purposeful and situated social practice introduced by genre pedagogy. Writing the research work, learners should also become more proficient in the use of computer-assisted tools that address such issues as, for example, text processing, information mining, terminology management, pre-editing, post-editing, and proofreading.

Keywords: ICT competence, second language acquisition, scientific text processing, research writing, communication skills, rhetorical devices

1. Introduction

The major tendency in the contemporary education system is the integration and innovative use of digital technologies, which results in the paradigm shift from traditional teaching to teaching of the 21st century skills, with focus on digital literacy. The 21st century skills include, among others, problem-solving, critical-thinking, multi-literacy, creativity, learning to learn, as well as linguistic and cultural competence. Many online tools belonging to the family of Web 2.0 technologies develop the 21st century skills and facilitate the learning process through collaboration, communication and interactivity. In the past decade, digital literacy has been gaining increasing attention from researchers, educators and policy makers in the field of education. In the constantly evolving world, digital literacy can be regarded as "the constantly changing practices through which people make traceable meanings using digital technologies" [1]. Digital literacy is constantly developing by new tools invented and derived

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from technological convergence. This transformation – the Fourth Industrial Revolution – is not defined by any particular set of emerging technologies themselves, but rather by the transition to new systems that are being built on the infrastructure of the digital revolution [2]. Thus, digital literacy incorporates a set of various competences, including the Internet, ICT, media and information literacy. Nowadays being digitally literate implies the ability to understand media, to search and critically evaluate the information and be able to communicate with others using digital tools and applications [cf. 3].

Ubiquity, accessibility, ease of use, integrity and fast feedback are the main features of learners' daily experience with digital technologies, which are changing their expectations of education [cf. 4]. Education is not considered any more as a sole process of knowledge transfer, but the process that involves (re)creation, creativity, experimentation, critical awareness and reflection. The development of digital literacy was the starting point for the changes in pedagogy and, as a result, in the system of higher education. It is obvious that in the future, students will increasingly need the skills of text analysis, data mining and information retrieval.

The New Skills Agenda for Europe recommends the EU member states to develop digital skills in education. Due to this global change “the EU member states, business and individuals need to rise to the challenge and invest more in digital skills formation (including coding / computer science) across the whole spectrum of education and training” [5].

The present study is mainly based on the interrelation of pedagogy, knowledge creation (content), and technology by identifying new and emerging teaching methods, determining the efficient practices of technology use in the second language acquisition, in general, and revealing useful online resources in academic / research writing, in particular.

2. Academic Writing Teaching

The course in academic writing was approbated on the students of professional Master study programme “Technical Translation” implemented by the Institute of Applied Linguistics, Riga Technical University. The programme is included in the EMT network. Master students already possess an advanced level of linguistic and thematic competence. The course teaches the students to master a set of skills such as finding, analysing, interpreting and evaluating information in terms of credibility and relevance as well as presenting innovative ideas based on extensive research. Academic writing skills involve critical and creative thinking, analytical reasoning, decision-making and problem-solving skills, as well as digital literacy. Therefore, the skills involved in academic writing make it one of the most difficult competencies to acquire for a second-language learner.

The present paper aims to identify the main aspects of digital literacy in the second language acquisition, in general, and in teaching academic (research) writing, in particular. To improve written communication skills, it is necessary to develop learners' conscious understanding of conventions of academic text creation and language resources, which should be used to convey the intended message.

Academic writing teaching was traditionally based on product and process writing approaches. Product approach focused on analysing and imitating text samples or models, while the process writing approach aimed at practising pre-writing, writing and post-writing strategies, such as brainstorming, note-taking, drafting, proofreading etc.

In relation to the second language teaching, at present writing is seen as a purposeful and situated social practice introduced by genre pedagogy. In this context, genre pedagogy is associated with Vygotsky's sociocultural theory of human learning that considers the relevance of collaboration and scaffolding (teacher-supported feedback). Genre awareness is the “rhetorical flexibility necessary for adapting...to ever-evolving contexts” [6]. This approach interweaves language, content and context. According to Hyland [7], “genre is one of the most important and influential concepts in literacy education.” Genres can also be referred to as “socio-cognitive schemas” (Johns 2008, 239) as they enable learners to encode, retrieve and process information.

Approaches of genre pedagogy have gained prominent attention in teaching English for Specific Purposes and English for Academic Purposes ([7], [8], [9]). The authors argue that the main



advantages of genre pedagogy include explicitness, systematic organisation, needs analysis, supportive framework, criticism and consciousness. On the contrary to traditional product and process writing approaches, a genre-based approach views the text in relation to the context. Genre researchers “aim to draw together language, content, and the context of discourse production and interpretation” [10]. Paltridge [10] encourages educators to think of using activities that focus on three levels: (1) genre and context, (2) genre and discourse, and (3) genre and language. This approach is especially important in the creation and research of LSP texts as the purpose of the text, its function and the context determine the organisation and the language resources of the specialised text.

3. The Use of Technologies in Academic Writing

Growing attention has been devoted to pedagogic theories and approaches that include technologies facilitating students to enhance their innovative and creative skills. Technology-enabled education is seen by many practitioners as an opportunity to shift from teacher-centred to student-centred learning [11], which is the essential core of constructivist learning, i.e., learners construct their own knowledge and meaning from their experiences.

By integrating technologies in education, the need arises to revise and reconsider teaching and learning approaches. To address the issues of technology-enabled education, Cope and Kalantzis [12] formulated the following constituents of efficient pedagogical practices:

- Situated practice, which draws on the experience of meaning-making in everyday life;
- Overt instruction, through which students develop an explicit metalanguage of design;
- Critical framing, which interprets the social context and purpose of the intended meaning design;
- Transformed practice, in which students, as meaning-makers, become designers of social futures.

Mayes and De Freitas [13] propose classifying learning and teaching approaches into three broad categories:

- associative (acquisition of skills through tasks and feedback);
- cognitive (construction of meaning based on prior experience and context);
- situative (learning in social and/or authentic settings).

These approaches can be integrated in technology-enhanced learning environments that focus on learning practices and experiences.

Enquiry, experimentation and reflection make the foundation of effective teaching and learning. Reflection is considered an important part of the learning process and there are many theories about its role in the process of enhancing learning. Reflection is usually described as a type of thinking which enables a kind of problem solving, involving the construction of an understanding and reframing of the situation. Reflection is also considered to play an integral role in learning from experience. Some researchers have developed learning cycles (concrete experience, observation and reflection, forming abstract concepts, testing in new situations) where the learners gain learning experience and then reflect on it. For example, Kolb [14] suggests that reflection allows the learners to form abstract concepts from their experience in order to guide active experimentation and further learning experiences.

4. Case Study

The present case study reflects on the results of the on-going research on the efficient use of digital tools and innovative technologies in LSP Master students' training. The study was performed in two groups of 28 students.

Table 1 provides a list of online resources that can support students in developing academic writing skills. The list below is a merely illustrative and not exclusive example of the use of online resources in the second language acquisition and in academic writing, in particular. The resources provided below were successfully approbated during the study course.



Table 1. Illustrative list of online resources in academic writing

Pre-writing resources	Description
ManyBooks	Resource providing books on nearly every topic for research
Brainy Quote	Source of citations from different authors
Goodreads	Extensive list of book reviews and recommendations on the best books for reading, reviewing and citing
IPL	Open source library providing information on different topics
DMOZ	Directory of links to reputable websites and other informative resources
Scholarpedia	Website similar to Wikipedia, but it is more reliable as its content is written and checked by scholars
Mendeley	Free reference manager that allows creating one's own fully-searchable library
Glossary of Essay Terms	Glossary of key terms on essay writing
Better Writing	Resource to improve the quality of academic and research papers
Vocabulary resources	
The Free Dictionary	Collection of dictionaries, encyclopaedias
The Ozdic Collocation Dictionary	The online English Collocations Dictionary
Writing instructions	
The OWL	Source of academic writing instructions from Purdue University's Writing Lab
Daily Writing Tips	Useful tips on writing (e.g., vocabulary, grammar, spelling etc.)
Academhack	Resource on effective writing strategies with the help of online tools
Post-writing resources	
Bib me	Resource to format writing works properly, using a particular citation style (APA, Chicago, etc.), as well as check for plagiarism
Zotero	Source for collection and management of sources used in the writing
Collaboration and feedback resources	
Quora	Source to find the information, share ideas, ask questions
Writing.com	Online community for writers

Integrative, reflective, collaborative, inquiry-, project- and problem-based strategies use information processing to support students' learning about issues of meaning and relevance. In student-centred learning environments, technologies are used to generate and organise ideas (concept and mind mapping tools), search for the latest information (search engines, periodicals, online books etc.), format research works (word processing software), cite properly and check for plagiarism as well as present portfolios and projects (presentation software).

The learning and teaching approaches used in academic writing associate with the acquisition of social and cognitive competencies, and also with digital literacy – skills related to engaging with, consuming and producing digital media (cf. [15]). It should be noted that innovative and efficient

pedagogies focus on the best practices incorporated in the activity aimed to develop certain skills taking into consideration the use of appropriate tools or technologies. Therefore, technology-enabled learning environments provide new opportunities in terms of contextual, distributed, meaning-making and collaborative learning. It should be noted that well-designed learning environment offers learners the opportunity to gain a better understanding of their own experiences.

5. Conclusions

Development of digital competence allows responding to challenges posed by changes in modern texts, which are characterised by uncontrolled creative use of language resources resulting in the infinite number of meaning combinations.

In the digital era, the ability to interact meaningfully with digital tools is a pre-requisite for successful learning. Multidisciplinary research and innovative methods give the opportunity, using digital classrooms, to develop students' creativity, innovation and critical thinking.

Efficient teaching practices demonstrate that new technologies should be used alongside traditional methods of teaching in order to optimise learner's experience by providing access to relevant learning scenario. Integration of digital tools in the learning process is efficient if it enables the creation of added value both in real-time settings and online.

At present, to be proficient in academic writing has become even a more challenging task due to the constantly growing volume of information, the intertextual character and multimodal nature of a modern LSP text. The main challenge of genre pedagogy approach in modern research writing is to create a student-centred learning environment that promotes the efficient use of digital tools and applications for life-long learning and sustainable development.

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