



UNIWERSYTET RZESZOWSKI
WYDZIAŁ FILOLOGICZNY
INSTYTUT FILOLOGII ANGIELSKIEJ

Robert Oliwa

**Design and implementation of virtual environment
management of foreign language learning instruction
in adult learner groups**

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dr hab. prof. UR Agnieszki Uberman
Promotor pomocniczy:
dr Marta Dick-Bursztyn

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SUMMARY

Introduction

Modern-day society strives to reach a progressively higher level of development in areas such as economy, commerce, science, culture, education or technology and continual changes are a central factor determining many phenomena which occur worldwide. The progress of ubiquitous information technologies has led not only to an increase in the number of computers and electronic devices but also to the arrival of entirely new environments where interaction amongst its users takes place. Implementation of a new technology or tool in one area is promptly mirrored in other areas and those are also subject to dynamic alterations afterwards.

The concept of education, its partakers, principles and resources as well as the environment where this process takes place has been revisited many a time in the last few decades. Although the language, both spoken and written, still remains the leading communication tool, the means of communication, learning environments and methods of enhancing students' competence have changed in both academic and professional settings. The growing interest in the influence modern computer technologies have on academic attainment stimulates a lot of discussion. Psychologists, linguists and educators attempt to examine the impact the internet and the tools it provides, including virtual environments, have on the process of learning. Receiving precise answers proves challenging because it is a multifaceted phenomenon which is subject to many variables. Consequently, it is legitimate to say that there is no clear position on the effect computers and the internet have on the learning process.

The topic of designing the instructional process and implementing appropriate models has been widely discussed in foreign and Polish specialist literature. The broad spectrum of existing designs and models, which derive from various theories and approaches, is conditional on unceasing development possible because of the new opportunities instructional material construction and technology may and do offer. However, most decisively owing to changes the app generation have undergone such as technology seduction and dependence, parallel task processing, multitasking or the development of new digital literacies (Gardener and Davis 2014), designing education has become a complex undertaking. Hence, the need to study the process of designing and implementing computer or, as is often the case, internet-assisted instruction in an

educational setting seems to be a significant and worthwhile experience because of its research and pragmatic value.

Cognisant of the multifacetedness of virtual foreign language learning in addition to its novelty and scientific importance, the author seeks to study the relationship between augmentation of traditional foreign language instruction of adult learners with a virtual learning environment and assess its impact on the learners' attainment in the fields of speaking, listening and grammar.

The thesis is composed six parts all of which play a key role in the presentation of the content and outcomes of the research project. The introductory chapter describes the aim of the study, provides the main thesis and supporting hypotheses in addition to justifying the choice of research problems. The first chapter concentrates on the development of theory of instructional and material design in education as well as foreign language teaching and learning. The second chapter presents the theory of the construction of teaching materials and investigates the selected models of instructional design. In addition, it presents the current state of research in the field, including language teaching with the application of different instructional settings. Moreover, it carries out a detailed analysis of four chosen virtual learning platforms. Chapter three addresses the author's own foreign language virtual instructional model which is composed of seven stages during which participants' learning needs are revealed and instructional content is developed, delivered and evaluated. Finally, the last stage focuses on retrieving and activating knowledge from the already constructed database. In chapter four the author concentrates on research design and characteristics of the virtual environment as well as its participants, and specifies the research methods, aims and problems. However, first and foremost, chapter four presents the analysis of collected data concerning the linguistic performance in speaking, listening and grammar of the experimental group (EG) compared with the linguistic performance of the control group (CG) in the same areas. The objective of the last chapter is to recognise the variables determining the effectiveness of the proposed instructional model, the virtual learning environment and success factors for implementing virtual instructional models in school and work environments.

Theoretical foundations

The current instructional design landscape shows the relationships between the basic concepts and processes of instructional theory, the systems it has created as well as instructional design and models. These are resultant of the main principles on which learning and teaching depend as well as the practice of augmenting educational experiences which encourage and facilitate the acquisition of knowledge and skills. Psychological and learning theories which have influenced the instructional design include behaviourism, cognitivism, constructivism as well as the whole spectrum of modern developments which take into consideration student variables, teacher variables, integrative approaches, integration of instructional designs, design adaptability, further development of learning and instructional theories, internet (computer) aided instruction and virtual realities. The research has proved that it is unworkable to establish one instructional model which would fit all needs, environments as well as learners and which would provide a setting where learners behave in the same way besides giving stimuli to which they all respond alike (Kozma 2005).

At present, the classroom setting has acquired a completely new dimension of virtuality, mobility and shareability. Therefore, instructional design is moving away from process-centeredness and is creating an environment which is learner-centred, “recursive and non-linear, engaging, self-directed, and meaningful from the learner’s perspective” (McCombs 2000:1).

The available research enables an observer to perceive virtual education from many standpoints, namely students’ academic performance, teacher training, institutional implementation, pedagogical theories and models as well as other considerations such as students’ psychological characteristics, costs or parental involvement. The principal consideration is the impact virtual learning has on students’ school accomplishments. Here, the research reveals twofold outcomes. On the one hand, the students who access virtual resources perform better in the courses examined (Study Report: Virtual Learning Platforms in Europe 2010). However, on the other hand, they may achieve poorer results (NEPC Report 2013). Some published research uses flawed means of measuring students’ performance (school size, number of students, virtual learning model) or examines a fraction of available courses (e.g. Algebra and English). Additionally, there is very little dependable research on the use of virtual environments

in language learning and many of the proposed hypotheses have not been supported by evidence.

Another issue is the availability of analyses and transparency of outcomes which are sometimes shown in the most positive light. This may distort facts and make interpretation hard. Overall, virtual learning environments have become an extension of a traditional classroom, providing a variety of courses. The existing research indicates that they have no undesirable impact on regular classes and may contribute to better academic results as online instruction opens new possibilities, such as mobile VLEs or virtual worlds. From the pedagogical viewpoint, VLEs do not have a direct bearing on the quality of teaching and learning. They may, however, improve this quality when used from the commencement of the teaching process and not applied as substitution or intervention. Hence, more pedagogical, cross-cultural and institutional research is indispensable with the purpose of finding out further corroboration of the value of virtual learning and virtual language learning.

Methodology

The study is ascribed to investigate **if the implementation of a virtual learning environment into regular foreign language instruction, as an augmentation of the regular classroom practice, has an impact on adult learners' speaking (productive skills), listening (receptive skills) and grammatical competence.** Furthermore, the following hypotheses were generated:

1. A virtual learning environment may become an augmentation of regular foreign language instruction.
2. The implementation of a virtual learning environment must follow an instructional model to be efficacious.
3. Adult learners of English may benefit from their exposure and access to content distributed online.

The research concentrates on two groups of English Studies students: the experimental group (**EG**) and the control group (**CG**). The students are English in Business and Multimedia major and Teaching English as a Foreign Language major. The groups consisted of 38 students in total; 16 students in the EG and 22 students in the CG. During the course of their studies the students are taught, in terms of theoretical and practical training, to fulfil professional roles and to participate fully in the socio-economic, political and cultural life of a local community, the country and worldwide.

The professional roles they can serve depend on the specialisations they choose to undertake.

The thesis made use of the mixed methods research design. The purpose of such a choice originates from the fact that, on the one hand, the qualitative design gives a better, more natural sense of the subject, whereas on the other the quantitative design provides impartial insight and analysis, holistic attitude, personal contact with the participants as well as progressive and contextualised data collection (Patton in Kubinowski 2010). Besides, the qualitative research design will note such features of the method as formal context where the researched groups accomplish their educational tasks, evaluate participants' tacit knowledge (Polanyi 1967) and evaluate multi-layered nature of outcomes. Qualitative research flexibly adjusts methods and tools in response to the context and available data (Ritchie et al. 2003). In contrast, the quantitative research design enables the researcher to investigate collected data and try out hypotheses during experiments by means of statistics. Likewise, examining samples of individuals or groups of people, the quantitative research can ensure that the results will be characteristic of larger groups. In the end, the quantitative data analysis is less expensive and time consuming as it uses the computers to analyse the gathered data (Connolly 2007).

As regards the schedule of data collection the design adhered to the sequential procedure which was in accordance with the instructional model the research implemented. It facilitated intermingling of the quantitative and qualitative designs, the use of one method to support and manage the results acquired with the other method and exploration of the results in the interpretation phase (Creswell 2009). The strategy also helped the author begin with qualitative methods and next move on to quantitative methods to support the understanding of the problem.

The research project took place at State Higher School of Technology and Economics in Jarosław among Year II undergraduate students of English Studies. The three basic areas which were studied in this thesis include speaking, listening and grammar. The speaking and listening classes were scheduled every other week and lasted ninety minutes in each group. The grammar classes took place every week for ninety minutes in each group as well. The EG's learning space was augmented by a virtual learning environment established on CANVAS.INSTRUCTURE.COM, an open-source, customisable virtual environment. The virtual content, supported by local or shared media formats was available on the CANVAS platform to the members of the

EG over a period of six months, from October to March, as an extension of regular classroom-based instruction and later in the form of follow-up content. Both groups' participation and attainments were studied and analysed on the basis of tests and tasks administered at different stages of the research. The three aforesaid areas were studied in isolation; however, the whole research assumed a holistic approach to students' performance. It was observed during three regular courses extended with online materials. Implementation of online content followed the author's own model which included seven stages - *Identify, Name, Develop, Pilot, Conduct, Evaluate* and *Retain*. Two stages, *Pilot* and *Conduct*, were extended by two inter-stages called *Collect* whose objective is to gather feedback regarding the instructional experience of both groups for possible modifications. Table 1 below illustrates the arrangement of the research activities undertaken by the author.

| Stage of the instructional model | Methods | Tools and procedures |
|---|----------------------------------|--|
| <i>Identify</i> | qualitative + quantitative | - document analysis - interview - language competence test - online survey |
| <i>Name Develop</i> | - | - |
| <i>Pilot (+ Collect)</i> | qualitative | - virtual ethnography - discourse analysis - interview |
| <i>Conduct (+ Collect)</i> | qualitative + quantitative | - summative test - virtual ethnography |
| <i>Evaluate</i> | qualitative | - multiple-case studies - observation - discourse analysis - virtual ethnography - interview |
| <i>Retain</i> | qualitative + quantitative | - virtual ethnography |

Table 1. Mixed-methods design procedures.

Results

The initial part of the research concluded that if an existing IT infrastructure provides appropriate facilities to act on the changing educational setting and expressed students' needs and requirements, hybrid, blended or online instruction ought to be offered to the students. Such a response may be provided if, first of all, there is interest on the teachers' part. With regard to the characteristics of the research participants it was discovered that they approach foreign language learning pragmatically and regard a foreign language as a tool for achieving aims such as work, travel or emigration. The language skills the students wish to focus on encompass listening and speaking in the area of conversation as well as social interaction. In respect of the grammatical competence students are cognisant of its significance as well as their needs; however, modifications are essential to be made to the current methods by which grammar is taught. Finally, the students perceive the internet as a potential environment where foreign languages can be studied. The fourth stage of the instructional model discovered that the virtual learning environment (VLE) was accessed by the students with an inconsistent frequency. There were students who showed very little interest in this way of instruction. On the other hand, the majority of the students expressed positive opinions about CANVAS after the *Pilot* stage claiming that it was valuable and supportive. Such a discord between the students' online presence and behaviour and their opinions may originate from the fact that the students become less creative having access to online content and are members of the adigital group who "[...] does not feel that the internet makes their life more efficient, nor do they enjoy being online to be entertained or escape from the real world" (Dutton and Blank 2015:14). They may also hold the view that the internet pervades their life too much and they would rather study using the traditional approach.

The *Conduct* stage allowed the author to draw the following conclusions as regards the quantitative analysis. As Table 2 below indicates there were no noteworthy discrepancies between the two groups' achievement in the researched areas. With regard to the grammatical competence, the augmentation of the regular classes with the VLE did not contribute to its improvement in the EG compared with the results obtained by the CG. Correspondingly, concerning the listening competence, the VLE was not instrumental in enhancing the EG students' listening proficiency. Conversely, while the results remained at the same level, the CG improved their listening competence. Finally,

with regard to speaking, the statistical analysis did not reveal any important differences between the two groups. All these outcomes point to the fact that the implementation of a virtual learning environment into regular foreign language instruction, as an augmentation of the regular classroom, may help students to maintain their initial level of the linguistic competences only, may not assist their progress, but can also delay or hamper their improvement which, without the intervention, may be faster or more noticeable.

| Variable | | <i>N</i> | <i>M</i> | <i>SD</i> | <i>Mdn</i> | <i>Min</i> | <i>Max</i> |
|----------------------------|--------------|----------|----------|-----------|------------|------------|------------|
| Grammar [%] | Test 1 | 27 | 54,85% | 16,01% | 51% | 23% | 86% |
| | Test 2 | 25 | 70,16% | 21,43% | 68% | 12% | 96% |
| | Test 3 | 26 | 54,08% | 20,21% | 49,50% | 10% | 94% |
| | Test 4 | 24 | 73,81% | 11,69% | 75% | 43% | 89% |
| | Test 5 | 27 | 60,33% | 14,98% | 55% | 31% | 89% |
| | Test 6 | 21 | 54,55% | 15,60% | 53% | 18% | 77% |
| | Total | 35 | 60,53% | 14,82% | 62,33% | 25,17% | 87,40% |
| Listening [%] | Test 1 | 22 | 71,14% | 14,60% | 71% | 37% | 100% |
| | Test 2 | 24 | 69,58% | 14,24% | 66% | 33% | 89% |
| | Test 3 | 26 | 73,38% | 20,52% | 80% | 20% | 100% |
| | Test 4 | 19 | 84,63% | 12,60% | 80% | 70% | 100% |
| | Test 5 | 32 | 80,22% | 11,74% | 85% | 55% | 100% |
| | Test 6 | 34 | 78,62% | 11,21% | 76% | 60% | 96% |
| | Total | 35 | 76,57% | 11,05% | 77,60% | 52,75% | 92,83% |
| Fluency [pts] | Task 1 | 32 | 3,16 | 0,63 | 3 | 2 | 4 |
| | Task 2 | 31 | 3,13 | 0,67 | 3 | 2 | 4 |
| | Task 3 | 25 | 3,44 | 0,92 | 3 | 2 | 5 |
| | Task 4 | 31 | 3,65 | 0,75 | 4 | 2 | 5 |
| | Total | 35 | 3,30 | 0,66 | 3,25 | 2 | 4,50 |
| Lexis [pts] | Task 1 | 32 | 3,16 | 0,63 | 3 | 2 | 4 |
| | Task 2 | 31 | 3,16 | 0,86 | 3 | 2 | 5 |
| | Task 3 | 25 | 3,24 | 0,83 | 3 | 2 | 5 |
| | Task 4 | 31 | 3,23 | 0,62 | 3 | 2 | 5 |
| | Total | 35 | 3,15 | 0,66 | 3 | 2 | 4,75 |
| Grammar [pts] | Task 1 | 32 | 3,19 | 0,64 | 3 | 2 | 4 |
| | Task 2 | 31 | 3,03 | 0,80 | 3 | 2 | 5 |
| | Task 3 | 25 | 3,12 | 0,83 | 3 | 2 | 5 |
| | Task 4 | 31 | 3,10 | 0,75 | 3 | 2 | 4 |
| | Total | 35 | 3,09 | 0,66 | 3 | 2 | 4,50 |
| Pronunciation [pts] | Task 1 | 32 | 3,09 | 0,93 | 3 | 1 | 5 |
| | Task 2 | 31 | 3,06 | 0,89 | 3 | 1 | 5 |
| | Task 3 | 25 | 3,28 | 0,89 | 3 | 1 | 5 |
| | Task 4 | 31 | 3,23 | 0,84 | 3 | 1 | 5 |
| | Total | 35 | 3,13 | 0,81 | 3 | 1 | 5 |
| Interaction [pts] | Task 1 | 32 | 4,09 | 0,78 | 4 | 2 | 5 |
| | Task 2 | 31 | 3,97 | 0,84 | 4 | 2 | 5 |
| | Task 3 | 25 | 3,92 | 0,81 | 4 | 2 | 5 |

| Variable | | <i>N</i> | <i>M</i> | <i>SD</i> | <i>Mdn</i> | <i>Min</i> | <i>Max</i> |
|-----------------------------|--------------|----------|----------|-----------|------------|------------|------------|
| | Task 4 | 31 | 3,81 | 0,91 | 4 | 2 | 5 |
| | Total | 35 | 3,94 | 0,82 | 4 | 2 | 5 |
| Speaking final [pts] | Task 1 | 32 | 16,72 | 3,20 | 16 | 9 | 23 |
| | Task 2 | 31 | 16,39 | 3,26 | 16 | 11 | 24 |
| | Task 3 | 25 | 17,00 | 3,67 | 16 | 11 | 25 |
| | Task 4 | 31 | 17,00 | 3,17 | 17 | 11 | 23 |
| | Total | 35 | 16,62 | 3,10 | 16,33 | 10 | 23,75 |

Note

n number in subsample *M* mean *SD* standard deviation *Mdn* median

Table 2. Descriptive statistics of the examined students across different language competences within the research period.

Even though the statistical analysis of the two groups' test and task results did not show any significant differences, qualitative methods revealed what other influences of the VLE could be observed. Regular foreign language courses accompanied by the virtual content can facilitate higher order thinking skills. On top of memorising, defining and explaining concepts, the EG students were noted to be more capable of evaluating and analysing content critically, planning their linguistic output, creating utterances and paraphrasing them. It was predominantly visible in the case of the students with the most frequent online presence and behaviour. On the contrary, the students with the weakest online presence exhibited only elementary thinking strategies. Additionally, the virtual interaction might have a bearing on the social aspect of the instructional process. It was observed to bond the group internally and reinforce the sense of belonging which was confirmed by the fact that no EG students resigned from the studies over the research. Within the same period of time, 3 CG students dropped out. In addition, as the VLE enhanced information and knowledge instillation, the students felt more self-assured to express their opinions and participate in the discussions. The fear of being voice-recorded was noted to be slowly vanishing. Knowledge construction and retention which is now being observed in the *Retain* stage of the model may be a subject of further examination.

The final stage of the proposed instructional model, i.e. the *Evaluate* stage, also provided an abundance of results for interpretation and conclusion. All the examined students believed that their general linguistic competence was honed, especially as far as listening and speaking skills were concerned, irrespective of the teaching environment or method. The EG students perceived this improvement as the result of both the diversity of materials available in the VLE and the teacher's teaching style; whereas the CG students, having no contact with the VLE, cited the teaching style only.

This may put forward the fact that the internet is the most important and reliable element of the instructional process from students' perspectives. If it is not accessible, they resort to the teacher for information and knowledge. The most distinct improvement was achieved by the students who demonstrated basic knowledge and elementary language competence. This may suggest that advanced learners require other stimuli to advance both intellectually and linguistically, whereas elementary students require the types of incentives the internet provides to construct their knowledge and develop their competence. As shown before, the VLE may contribute to an improved social interaction within a group of students; however, in contrast, it may also lead to weak social interaction patterns outside a certain group and external socialising problems because some students may substitute traditional contacts with the teacher and other students for the virtual ones. All the outcomes of the research are consistent with the available source literature as they confirm that virtual learning environments do not have a negative impact on students' performance and may contribute to improved results. From the didactic standpoint, as the available research proves and this thesis confirms, online instruction does not directly determine the quality of foreign language instruction. It may, however, enhance other significant learning processes such as higher order thinking, learning strategies, social skills and computer or internet literacy. The discovered absence of significant influence of the content distributed online on adult students' grammar, listening and speaking competence does not denote that such an influence may not be discerned in other age groups and circumstances or that other competences are not developed.

The inferences drawn after the model implementation refer to students as subjects of the instructional process, efficiency in following stages of the model, their management and the model reusability. The inclusion of students into the process of content design in the *Identify* stage gave them agency on the one hand and made them accountable for participation and contribution on the other. Students, being a part of the content construction process, may contribute to a better topic selection and timing as well as discover their own and their peers' needs and potentials. A limitation of the proposed model and an area for development at the same time is the fact that the students are not allowed to create online content continuously. The designed course content augmented with the VLE might be made available for the students to access and, if required, to recommend changes to as suggested by O'Byrne (2014). The final stage of the proposed model is the *Retain* stage which is still under progress and it aims

at providing a self-study virtual environment which includes follow-up resources which are free to access for the students. The available virtual ethnography and observation show the VLE has not lost its value as a database of links and resources and a medium of information. Adult learners of English may benefit from the exposure and access to such internet-delivered content which the thesis also set out to evaluate and this has often been confirmed by the students who appreciated its availability and timeliness. The inadequacies brought up by the students in the research included little relevance of topics to current issues and not enough interaction or social engagement of the environment.

Evaluation of the research

The evaluation of the entire project includes the steps suggested by Kirkpatrick (1994), which include levels such as *Reaction*, *Learning*, *Behaviour* and *Results*. With reference to the *Reaction*, it can be indicated that the students had a changeable attitude towards the available online resources. Despite the declared interest, some students seldom took advantage of online learning. This may originate from factors such as the students' study load at that particular time, their lack of competence to transfer skills and knowledge acquired in the virtual environment into real classroom tasks. Furthermore, the students could hold the belief that performing online tasks was too time-consuming or uninteresting. On the other hand, the students (the control group) who were not offered any online resources expressed their willingness to apply such resources in their classes.

As regards the *Learning*, it can be stated that the VLE materials had little or no influence on the students' tests and tasks results which may suggest that appropriate classroom input can facilitate linguistic progress without the necessity to implement online resources to encourage genuine progress. Therefore, the author's preliminary conviction that enhancing regular foreign language classes with virtual resources would improve the students' language skills was not confirmed. The qualitative analysis of the students' performance, however, allowed the author to observe that higher order thinking, i.e. assessing, analysing content, planning linguistic output, creating content and paraphrasing, could be facilitated by regular exposure to online resources. Also, the use of internet resources may bring about the improvement of the students' digital (computer and internet) literacy, so requisite in the modern world.

The evaluation of the students' *Behavioural* patterns after the intervention revealed that the students were ready to take different viewpoints, follow instructions and adjust to the changing instructional environment. The changes of behaviour stemmed from the students' positive response to the author's invitation to take part in the research project as well as their pragmatic approach to tasks they performed and benefits they hoped to derive from them. However, there was no correlation between what the students declared and their tangible online presence and performance. The cause for this might embrace the complexity of behaviour assessment, especially on the internet, and the amount of time such behaviour changes required. In addition, the students may expect rapid improvement of their linguistic competence. When little or no improvement is observed by the students, intrinsic and instrumental motivation might weaken. The positive reinforcement provided by the teacher and the academic setting did not have impact on the students' attitude and behaviour.

The *Results* showed that the students were offered a considerable opportunity to improve their English language competence. They developed certain abilities such as managing their time and workload, meeting deadlines, working in the virtual environment, participating in interviews and being recorded. They also could develop and apply cognitive strategies and learning styles. Finally, the research revealed that there was a demand for long-term online instruction which would put the present infrastructure into service and convert some courses into an online format. Such a demand was also indicated to the Institute authorities for consideration and a potential expansion of e-courses.

Undertaking this research project has been an inestimable and greatly satisfying research experience which helped the author to appraise his own views and knowledge of the studied area. The research process has also shown that there are still implications for further investigation as regards the influence online learning platforms have on foreign language learning. Therefore, a larger scale long-term study is required not only to provide guidance for online learning implementation, but most importantly to respond to the questions which include: *Who is online learning for? Which is the best model of instruction? Which scientific areas may benefit from it? How to create virtual learning?* and *What is the cost of e-learning?* The personal interest in the area as well as the research conducted to date have encouraged the author to seek answers to the above questions in order to contribute to the personal development and the improvement of foreign language teaching.