Organisation of Distance Learning in an International Educational Environment: Online Course «Supply Chain Finance»

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Abstract

The article gives a short overview of theories on didactics and distance learning used in the framework of an online course in English, given by a senior lecturer from the Netherlands (HAN) to students of the faculty of Economics of Chelyabinsk State University (CSU), to let students get experience in distance learning in an international educational environment and acquire knowledge on the topic Supply Chain Finance (SCF).

The teaching material of the course was represented by six lectures recorded by J. Jansen and available online (www.principlesofsupplychainfinance.nl/scf-course/).

Combination of the recorded lectures and interactive online seminars for discussion of home assignments allows students to gain a deeper understanding of the topic SCF. Finally, the course was finished with an individual online oral exam. Students and teaching staff of CSU evaluated this extra-curricular course. This pilot of distance learning will be developed into a course of a master programme at the faculty of Economics of CSU. The educational theories of Biggs, Bloom, Hattie, Garrison, Vaughan, Klabbers, Sousa and Kolb were applied to provide students with the best modern experience of distance learning.

Introduction

Distance learning, blended learning and flipping the classroom are all didactics that might be interesting to adapt in an international classroom setting. Staff exchange in higher education is one of the vehicles to have more internationalisation for students; in the past decades there were a lot of initiatives to have this type of internationalisation.

Sometimes faculty moved for a semester or term abroad, or via an intensive course for a week. Normally it is quite expensive to organise, plus a lot of personal impact on the life of the lecturer (and his or her family).

In this paper we would like to investigate one of the modes of distance learning, combined with flipping the classroom and blended learning.

Based on a track record of nearly two decades of collaboration between the faculty of economics of Chelyabinsk State University (CSU) and University of Applied Sciences Arnhem Nijmegen (HAN), an initiative was developed under the authority of the dean of the faculty economics of CSU. A senior lecturer/researcher of HAN, and two lecturers (one from CSU and one from HAN) were involved to deliver a semester distance learning course in the field of Supply Chain Finance.

This SCF course was based on an existing course (with a track record of 10 academic semesters), and two publications of the course instructor (Jansen, 2016a) (Jansen, 2018).

The distance learning course was customised for students of CSU, so they were able to learn a new subject (Supply Chain Finance), but also be exposed to new learning and assessment methods via distance learning in a foreign language (English).

Main Text

Literature review

In this literature review, the authors aim to give a relevant overview (in the scope of this article) of the didactics in general and the didactics in teaching economic subjects.

The standard literature to train future teachers of economics is scarce, although one English textbook (Economics Network, 2020) and one Flemish textbook (De Wiite & Schelfhout, 2015) have to be mentioned as sources of inspiration for the authors.

This literature review is based on state-of-the-art discussions in general didactics and didactics in teaching economics about topics like; 21st century skills, visible learning, lean in the classroom, flipping the class room, distance learning, blended learning, constructive alignment, revised taxonomy of Bloom and hybrid learning.

Teaching and learning in the 21st century.

The learning pyramid provides us information about more active ways of teaching tools (based on the so-called retention rates of the research on how the brain learns). Retention is the preservation of learning in long-term storage in such a way that it can be accessed quickly and accurately. So different teaching methods, such as lectures, reading a textbook or audio materials, have different retention rates, and interactive teaching methods, such as discussions or practice, are more effective than lectures or reading a textbook (Sousa, 2006).

The learning pyramid in figure 1 created a lot of academic discussion about the exact numbers of the retention rates, more important is to think about the effectiveness of participating teaching methods for students in higher education (Economics Network, 2020), and to create a tool box for academic instructors to serve the teaching process in the best way: *'Different didactics for different purposes'* as a didactical variant of the well-known quote in economics of J.M. Clark's (1923) *'Different costs for different purposes'* (Schroeffer, van der, 1964).

Visible learning model (the practice of teaching and learning).

In visible learning for teachers (Hattie, 2012) the maximizing impact on learning of students (and showing that to their teachers) has been introduced. The model is based on two principles: *'I see learning through the eyes of my students'* & *'I help students to become their own teachers'*, and on four stages that are relevant for the teacher and the student:

1. Mind frames
2. A cooperative and critical planner
3. An adaptive learning expert
4. A receiver of feedback

Lean in the classroom

Lean education is an organisation-wide strategy that wants to create value for students, by creating an effective learning environment, and short cyclic continuous improvement (and innovation) of the learning environment (and the elimination of waste) (Wiegel, 2020).

This results in a so-called House of lean learning and education (figure 2):

Adapting the lean way of teaching means that there is no waste in the process called education, so all educational activities are Just In Time (JIT) and according to the LAMDA principle: Look, Ask, Model, Discuss and Act.

This lean approach might be in contradiction with the ideas of 'Bildung[1]', when we try to teach more than what is needed to pass for an exam to check basic competencies like knowledge and skills (Horlacher, 2011).

Traditional teaching & learning versus Flipping the classroom

In traditional teaching & learning we structure a course week by week like in table 1. First we start with explaining the theory (often an economic model) often combined with an example in the lecture (Lecturer teaches and students listen and make notes), followed (often a few days later in the time table) with a seminar to discuss questions from the lectures and to prepare an assignment based on the lecture.

Week 1		Week 2		Week 3		Week n	
Lecture 1	Seminar 1	Lecture 2	Seminar 2	Lecture 3	Seminar 3	Lecture n	Seminar n
Theory	Exercise & Application	Theory	Exercise & Application	Theory	Exercise & Application	Theory	Exercise & Application

Table 1 Traditional teaching & learning

In the didactics of flipping the class room (Vazquez & Chiang, 2015), (Balaban, Gilleskie, & Tran, 2016) we have a different teaching strategy. The idea behind flipping the classroom is that students are able to study theory themselves (based on a good text book or articles) instead of listening to their lecturer introduce them to a new subject or topic. Face-to-face contact is now used to discuss more in depth the

new theory, and/or to apply the new theory in case studies, exercises, etc. to develop higher levels of learning.

An example of flipping the classroom (that we used in this case study) is visualised in table 2.

Week 1		Week 2		Week 3		Week n	
Self-study	Seminar 1	Self-study	Seminar 2	Self-study	Seminar 3	Self-study	Seminar n
Theory	Q & A ^[2] Exercise & Application	Theory	Q & A Exercise & Application	Theory	Q & A Exercise & Application	Theory	Q & A Exercise & Application

Table 2 Flipping the classroom

We start with self-study at home (or sometimes in a scheduled class meeting without a teacher) to read a chapter from a book and/or listen to an audio recorded slide presentation. The student has to prepare one or more assignments in order to get access to the seminar and sometimes students have to make a small formative or diagnostic test. In the seminar, there is more interaction than in the first mode of delivering education, because the group size is often smaller. The lecturer of the seminar is only discussing questions and/or discussing exercises or assignments. The lecturer is not allowed to do a substitute of the traditional lecture in the seminar.

Distance learning

Distance learning is about teaching (and learning) from a lecturer and a student in the case of physical distance between both (Sadeghi, 2019).

Distance learning has a long tradition^[1] in remote areas in the world (USA, Canada, Australia and Russia) and/or when students are not able to visit lectures/seminars at a university, because of career (working), disability, etc. Educational materials were sent by post to the students at home, so they could study week by week, receiving their materials (and their homework) by post (so-called correspondence courses). Later, disks, radio and television were used for distance learning.

Nowadays, distance learning is possible via the internet using IT technology like Zoom, MS Teams, or WebEx to communicate directly with students, electronic learning platforms (Moodle, Blackboard, etc.) for storing learning materials, and online simulations {e.g. The Cool Connection (Inchainge, 2020)}.

Blended learning

Blended learning is defined in terms of other activities than traditional teaching activities (like lecturing). In the text below a well-known description is provided (Garrison & Vaughan, 2008).

“Blended learning courses are those in which a significant amount of seat time, that is time spent in the classroom, is replaced with online activities that involve students in meeting course objectives”

“The thoughtful fusion of face-to-face and online learning experiences ... such that the strengths of each are blended into a unique learning experience... Blended learning is a fundamental redesign that transforms the structure of, and approach to, teaching and learning”

Blended learning might be organised via a serious game called The Cool Connection (Inchainge, 2020). In a team of four students (roles: Purchase, Sales, Logistics and Finance) they apply their integrated knowledge of Supply Chain Finance in a simulated business reality. The simulation is based on experiential learning in which a so-called (inductive) learning cycle is the teaching and learning paradigm (Kolb D. A., 1984a), (Klabbers, 2009).

Constructive alignment

Constructive alignment is a way of teaching where the (intended) learning outcomes are defined before the teaching process is executed. Teaching strategy (including the use of didactical tools), formative (or diagnostic) assessments and summative assessment are designed before the teaching and learning process starts. Constructive alignment operational framework has four stages (Biggs, 2014):

1. Description of the Intended Learning Outcomes (ILOs) for the study unit/subject in terms of topics/content
2. Creating a learning environment using Teaching/Learning Activities (TLAs)
3. Use Assessment Tasks (ATs)[\[2\]](#)
4. Judge how well ATs are transformed in final grades

The four stages of constructive alignment are summarised in figure 3.

Taxonomy of Bloom

Bloom distinguishes lower-order skills and higher-order skills (Bloom, Engelhart, Furst, Hill, & Krathwohl, 1956) to classify intended learning outcomes, as presented in table 3.

Type	Taxonomy
Higher order	Evaluation
	Synthesis
	Analysis
Lower order	Application
	Comprehension
	Knowledge

Table 3 Taxonomy of Bloom (Bloom, Engelhart, Furst, Hill, & Krathwohl, 1956)

Krathwohl revised Bloom's taxonomy, introducing meta-cognitive knowledge: being the awareness of and the knowledge about one's cognition (Krathwohl, 2002). Also, some minor changes in the taxonomy were carried out, see table 4.

	Knowledge			
Taxonomy	Factual	Conceptual	Procedural	Metacognitive
Create				
Evaluate				
Analyse				
Apply				
Understand				
Remember				

Table 4 Revised taxonomy of Bloom (Krathwohl, 2002)

Hybrid learning

So if we look to the three pillars of so-called hybrid learning (and teaching), old and new techniques of learning and teaching (using state-of-the-art IT tools) have to be combined like:

- distance learning;
- flipping the classroom;
- blended learning.

To summarise: Hybrid learning & teaching (figure 4) is based on six pillars (Constructive alignment, Distance learning, Flipping the classroom & Blended learning, Ways of learning, Formative learning and Summative assessment) using IT technology to communicate between students and their lecturer, or meeting each other in a classroom and/or in a virtual way.

Distance learning course Supply Chain Finance

This case study is based on the distance learning course Supply Chain Finance (<http://principlesofsupplychainfinance.nl/scf-course/>) and executed in October/November 2020 via distance learning mode between HAN University of Applied Sciences (Research group Logistics & Alliances) in the Netherlands and Chelyabinsk State University (Faculty of Economics) in the Russian Federation.

How was the course organised?

Students from the Faculty of Economics from Chelyabinsk State University had to read and listen to six lectures (using Microsoft PowerPoint slides with an audio track of the lecturer, providing explanation and clarification) to understand the several topics of Supply Chain Finance. After two lectures they had to prepare two exercises based on the previous two lectures for a Microsoft Teams meeting to discuss the content of the previous lectures and apply them as well in the exercises/assignments.

The goals of this SCF course were described in the following test grid (table 5) based on the theory of constructive alignment (Biggs, 2014).

Taxonomy	Criteria
Knowledge (40%)	<ul style="list-style-type: none">• Concept of SCF• Logistics/SCM & Corporate Finance & IT (ERP)• Induced working capital (static & dynamic)• SCF instruments (EBA^[5] classification)• SCF tactical level: IT platforms & Blockchain• SCF strategic level: Long term control of the supply chain in terms of Risk (COSO 2020 model) & EVA^[6]
Application (30%) & Comprehension (30%)	<ul style="list-style-type: none">• SCF metrics: SCF quick scan:<ul style="list-style-type: none">◦ C2C cycle◦ DuPont Analysis• Empirical data on SCF metrics<ul style="list-style-type: none">◦ Annual reports• EVA analysis• EAR^[7] calculations• SCF case studies• ETOs^[8] at tactical & strategic level using the multiple value model of Gleeson-White / IIRC

Table 5 Test grid SCF (Source: <http://principlesofsupplychainfinance.nl/scf-course/>)

After the theoretical part we originally planned that students were going to participate in the Supply Chain Finance simulation game The Cool Connection (Inchainge, 2020), applying their knowledge in an

integrated way in the real business world (based on the simulation model). Important goals in the game are: applying supply chain finance knowledge, decision making under time pressure, collaboration in a management team, and learning by doing. For practical reasons in this pilot, we decided not to run this serious game in this pilot.

Finally, the course was evaluated with an oral exam via MS Teams for about 30 minutes in which about 6 – 9 topics were discussed with the examinee (see table 6 for the topics).

#	Exam topics
1	SCF concept
2	Working capital (conceptual model)
3	SCF quick scan: Working capital, C2C cycle
4	SCF quick scan: DuPont formula
5	SCF instruments
6	SCF: Interest differences & EAR
7	SCF and IT (ERP, Blockchain, IT platforms, etc)
8	Case study: General
9	Case study: SCF specific
10	Reflection on TCC as a SCM / SCF professional (cancelled in this pilot)

Table 6 Structure of the oral exam (Made by the authors)

The course schedule is provided in table 7.

ent ity	Topics	Educational mode
ire	Concept of SCF Logistics/SCM & Corporate Finance & IT (ERP) Empirical data on SCF metrics: Annual report	Lecture via website ^[9]
ire	Induced working capital (static & dynamic) SCF metrics: SCF quick scan: C2C cycle & DuPont Analysis	Lecture via website
ing	Exercises 1 & 2	Interactive seminar via MS Teams
ire	SCF instruments (EBA classification) EAR calculations	Lecture via website
ire	SCF tactical level: IT platforms & Blockchain SCF case studies	Lecture via website
ing	Exercises 3 & 4	Interactive seminar via MS Teams
ire	SCF strategic level: Long term control of the supply chain in terms of Risk (COSO 2020 model) & EVA EVA analysis	Lecture via website
ire	ETO's at tactical & strategic level using the multiple value model of Gleeson-White / IIRC	Lecture via website
ing	Exercises 5 & 6	Interactive seminar via MS Teams
n	Oral exam of 30 minutes	Via MS Teams

Table 7 Course schedule (Made by the authors)

Evaluation

The evaluation was carried by a senior staff member of the faculty of Economics of Chelyabinsk State University under the authority of the faculty's dean.

The qualitative student's evaluation was based on the following topics:

- Course structure
- Course materials & didactics
- Level of difficulty
- Command of English
- Added value for the students

The results of the qualitative evaluation (SCF-course, 2020) are presented in table 8, using the six points of the evaluation from above.

Topic	Student's evaluation
Course structure	100% of students indicated that the structure of the course corresponds to the topic of the course and the content of the course was not overloaded with questions that did not correspond to the topic
Course materials & didactics	100% of students indicated that the content of the course has a practical focus and the material is presented in an accessible form
Level of difficulty	The course seemed difficult to 1/3 of the students. The rest indicated an average degree of difficulty
Command of English	The main barrier to mastering the course was noted by 1/3 of students to be an insufficient level of English proficiency
Added value for the students	Among the experience gained, the students pointed to new knowledge, experience of teaching in English, experience in organising and implementing supply chain finance at an enterprise.
Meeting expectations for the students	The course met the expectations of all students

Table 8 Evaluation SCF course

To conclude, the course was successful for the student's experience: new topic, using distance learning, and using English as the language of instruction and examining.

This student evaluation was confirmed by the staff evaluation of CSU and HAN. It was concluded that the course might have to be offered at a graduate level, instead of an undergraduate level. Future participants should have a good command of English and be aware of a so-called self-guided course (where the students are in charge of planning their own learning experience). The aspect of so-called meta-cognitive competencies was not covered in this pilot course; this might be an option for the next course (using for instance serious gaming as a didactical tool for deeper learning).

[1] In German language: Education (Bildung) is more than the Training of skills (Erziehung) according to von Humboldt (Horlacher, 2011)

[2] Q & A (Questions & Answers)

[3] Correspondence courses were quite popular from the end of the 19th century till about the 1980s in several parts of the world, and developed nowadays into internet driven educational systems (OnlineSchools, 2020)

[4] As a way of formative learning

[5] EBA = European Banking Association

[6] EVA = Economic Value Added

[7] EAR = Effective Annual Rate

[8] ETOs = Economic Trade-Offs

[9] <http://principlesofsupplychainfinance.nl/scf-course/>

Conclusion & Discussion

The SCF distance learning course was carried out successfully in terms of student and staff evaluation. Based on both evaluations some recommendations should be made for the next course in Autumn 2021 or Spring 2022.

Important outcomes of both evaluations are the requirements for the students that want to participate:

- Basic knowledge of Supply Chain Management (SCM), Logistics, Procurement and Marketing.
- Basic understanding of IT and its application in business via Enterprise Resource Planning (ERP).
- Good knowledge of Corporate Finance, especially in the field of Working Capital Management and financial ratios like; ROE, ROA, EVA, CR, QR, DIO, DSO, DPO, C2C, etc.
- Preferable level of education: Final stage of bachelor in economics or business administration or first year of master studies in economics or business administration.
- A good command of English (written and oral).

The educators' outcome of this pilot is a well-known principle in didactics: A good course is never finished! So continuous improvement of our own learning cycle (Design, Execute, Evaluate and Adjust) is also relevant for this case study and for the collaboration of both faculties (Jansen, 2016b).

For the evaluation of the course an individual oral exam is one of the options, but depending on the background of the students a small research project (using the SCF Quick Scan) in a company might also be an option to consider (transfer learning). The results of such a project can be presented on a mini-conference, using presentation techniques like the A3 poster from '*Lean in the classroom*' (Wiegel, 2020). Such a mini-conference disseminates the gained knowledge between the students of this course and the business environment in the Chelyabinsk region. Also, it is a nice example of transferring theory to practice and vice versa, which both are so essential for blended learning.

The use of a serious game like The Cool Connection (Inchainge, 2020) might be an option as well to let graduate students experience working in a management team to solve SCF issues in an integrated way (preventing so-called '*Silo thinking*') and to learn that in single loop learning (Klabbers, 2009) and double loop learning (Argyris & Schön, 1978).

Single loop learning and double loop learning are parts of the so-called experiential learning (Kolb D. A., 1984b) where learning is seen as: '*Learning is the process whereby knowledge is created through the*

transformation of experience. Experiential learning is, from a didactical point of view, creating a higher learning experience (Kolb D. A., 1984b), (Krathwohl, 2002), as well as a long time effect (Sousa, 2006), with a high retention rate (compared for instance to a traditional lecture).

Organising education in this way (using Internet driven serious games) opens also the possibility to establish '*internationalisation @ home*', when teams of students participate in such simulations as an international management team.

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Appendix

Distance learning in an international educational environment (university policy aspect)

In the case described in this article, a pilot group of students from the faculty of Economics from Chelyabinsk State University was exposed to a new way of teaching for them: a new topic (Supply Chain Finance), using English as the language of instruction, a new way of teaching using the didactics of flipping the classroom realised via electronic sources (PPT-files with audio on a website) and seminars via MS Teams.

Learning in an international educational environment gains increasing influence in higher education, especially in the form of distance learning. One of the main advantages of this training format is its flexibility. Students can review the course materials anytime, anywhere and at their own pace. The learning rate is set by the student himself depending on his psychological characteristics and personal preferences. In addition, students in the learning process gain experience of international communication improving their knowledge of a foreign language.

Numerous comparative studies of different learning formats show that distance education can be as effective as "traditional" full-time education (Nortvig, Petersen, & Balle, 2018). However, in order to achieve high learning outcomes and student satisfaction with distance education, it is necessary to take into account the influence of many other factors. Among them, the most significant influence is exerted by such factors as the level of organisation and maintenance of the course, the role of the senior lecturer and the quality of teaching materials, the level of interaction between the senior lecturer and students as well as between students (Agbanu, Sonyo, Region, & Ahiase, 2018).

Taking into account the influence of these factors, it is possible to determine a number of proposals for the organisation of distance learning in the international educational environment, contributing to an increase in the effectiveness of training and student satisfaction:

1. The provision of administrative support including full support of students in the learning process, timely announcements, periodically informing students about their progress and receiving feedback, in order to improve the learning process;
2. The provision of electronic and printed educational materials of high quality in terms of their relevance, usefulness and diversity. Ensuring the compliance of the actual load with the planned labor intensity and the fairness of the procedure for assessing learning outcomes. Fair and adequate assessment ensures that student efforts are properly assessed, thereby motivating students to do better;
3. Organisation of interaction between the teacher and students; encouraging students to actively participate in the discussion of course issues. In the traditional education system, this is ensured through personal interaction between students and the teacher. This allows you to get real feedback both through verbal communication and also through non-verbal communication (body language, gestures, facial expressions).

In addition, with face-to-face training, the teacher has the opportunity to directly interact with the learners and motivate them to study the subject, while in distance learning the interaction and motivation of learners becomes a significant problem. The solution to this problem is possible through the organisation of online classes and teleconferences providing direct interaction between the teacher and students in real time.

Figures

Figure 1

Learning pyramid

Figure 2

House of lean learning and education (Wiegel, 2020)

Figure 3

Constructive alignment based on (Biggs, 2014)

Figure 4

Hybrid learning (& teaching), developed by the authors based on M.Ed thesis (Nienhuis, 2020)