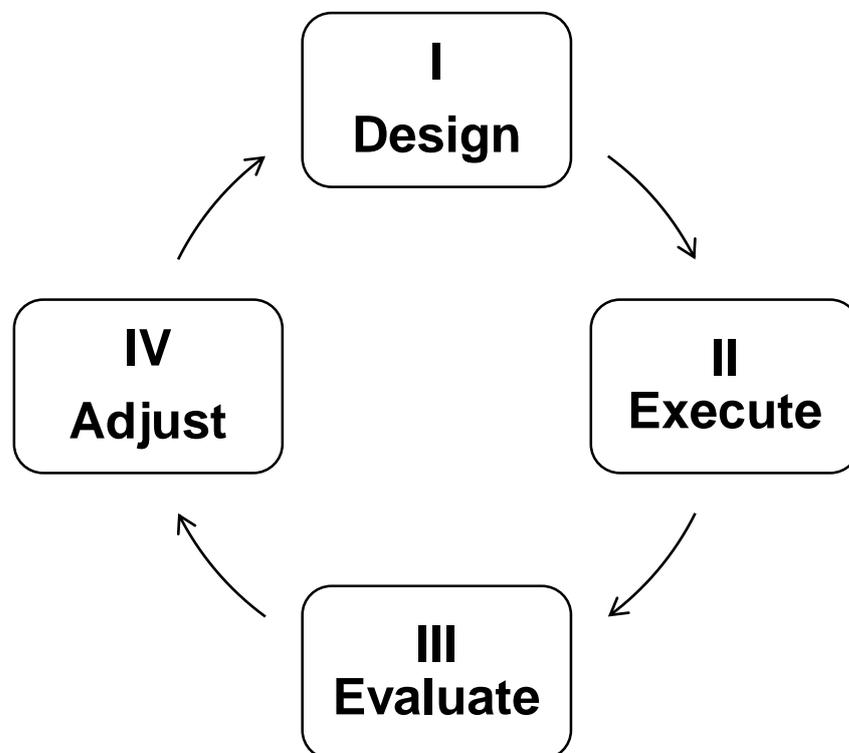


## Supply Chain Finance

### Evaluation of a new course for a BBA study in Logistics Management (Including a serious game: The Cool Connection)

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## **Key words**

Supply chain finance, Working capital, Supply chain management, Serious gaming, Course design, and Course evaluation.

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## **Introduction**

New trends in business are not only an interesting object for applied research at Universities of Applied Sciences, but the ultimate goal of this applied research to enrich educational programmes. The goal of the research group of Logistics and Alliances at HAN University of Applied Sciences is to up-date the teaching staff (lecturers) and the curriculum, so as the (bachelor) education and training is up-to-date to meet the state of the art requirements of (global) logistics business.

HAN University of Applied Sciences (Arnhem, the Netherlands) has a four-year bachelor study programme “Logistics Management and Economics “(BBA LME} Semester 7 is theoretical and it is aimed at preparing students for their graduation project in Semester 8 when the following four major topics will be covered:

- I. Supply Chain Operations
- II. Supply Chain Improvements
- III. Logistic Policy Plan
- IV. Management Skills

One of the subjects requiring development, and an integral part of Supply Chain Operations, is Supply Chain Finance (SCF).

*The goal of this article is to overview the background of this new subject SCF and the use of serious gaming (The Cool Connection), to discuss the Design, Execution, Evaluation, and Adjustments.*

## Background

Students accept industrial placement and study abroad in the 3<sup>rd</sup> academic year, returning for the 4<sup>th</sup> year to their studies in Arnhem.

One of the learning tracks in the curriculum is Finance. In general, the student faces in this final year (Keune & al, 2015) of his/her studies with:

- Scope and complexity of the task.
- Complexity of the professional situation (context).
- Level of independence and responsibility.

The educational goals of Supply Chain Finance are described as follows:

The student can sufficiently describe, analyse, and apply the knowledge of working capital management in the supply chain. In order to show this the student can:

- Explain the nature and role of supply chain finance.
- Describe in an international supply chain the role of the focal company as leading company for managing supply chain finance.
- Distinguish the static and dynamic approach of working capital.
- Relate the managing of working capital to production management and supply chain management.
- Demonstrate the consequences of working capital management in the DuPont identity.
- Evaluate the impact of managing working capital to the Economic Added Value (EVA<sup>TM</sup>) in the supply chain and for the focal company.
- Evaluate the performance of the supply chain finance simulation (The Cool Connection) in personal reflection.

In the curriculum model (see Appendix I) the four stages are described: Design, Execute, Evaluate, and Adjust that play an important role in the structure of this article.

Design is about the set-up of this subject in terms of lecture planning, literature, class assignments, slides, test grid, etc.

Execute deals with the educational process during one semester and 3 academic hours per week.

Evaluate is about the student's feedback to the questionnaires assessing the complete educational process (lectures, seminars, self-study, written exam, and serious gaming).

Adjust is the stage in the curriculum development process to fine tune the original design of this curriculum, in terms of continuous improvement of the PDCA or quality cycle.

## Design

The organisational boundaries for this subject are 3 academic hours per week (lectures / seminars) during a 14-week semester. At the end of the semester (weeks 15 and 16) a written exam should be planned. The full semester study load is budgeted for 105 academic hours or 3.75 ECTS<sup>1</sup> (Keune & al, 2015).

Supply Chain Finance should fit into the learning track “Finance” of this study programme in terms of concentric learning (Introduction to Finance, International Finance, Management accounting and Economic Trade Offs), as well as icing the financial cake of the study programme (Jansen J. , 2016).

During the first part of the semester the theoretical framework of Supply Chain Finance was developed, and in the second part students applied their knowledge in:

- Case studies (Heineken, Philips, Unilever, etc.).
- Performing in teams of four students with the Supply Chain Finance simulation “The Cool Connection” (The Cool Connection, 2016). The simulation is based on four roles that interact in a company (Purchase manager, Sales manager, Supply chain manager, and Finance manager).

The core literature used in this course includes:

- Fundamentals of Corporate Finance, Hillier et al. (Hillier & al., 2014).
- Cost accounting, Horngren et al. (Horngren & al, 2012).
- The Power of Supply Chain Finance, Steeman (Steeman M. , 2016).
- Supply chain finance, its practical relevance and strategic value (Steeman & al., 2015).
- Article Supply Chain Finance, Jansen (Jansen J. , 2016).
- Supply Chain Finance – European market guide, EBA (Euro Banking Association (EBA), 2014).
- SCF case studies and annual reports of case study companies.

According the EBA report (Euro Banking Association (EBA), 2014), the standard SCF instruments were discussed during the classes (see also Appendix II):

- Reversed factoring.
- Dynamic discounting.
- Electronic Data Interchange (EDI) solutions.

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<sup>1</sup> 1 ECTS (European Credit Transfer System) stands for an academic study load of 28 hours

The test grid for the written exam was structured as follows:

- 40% (Knowledge & Application)
  - SCF paradigm
  - the nature and role of Supply Chain Finance
  - the main features of Working Capital Management
  - the mechanics of the DuPont Identity
- 20% (Comprehension) Cool Connection Game
  - personal reflection (learning experience with a clear link to SCF) of SCF simulation
- 40% (Comprehension) case related SCF application
  - recognise the SCF problem
  - analyse the SCF problem
  - suggest the ways of SCF problem solving (quantitative & qualitative)

Knowledge, Application, and Comprehension (including Transfer) are assessment criteria based on the well-known Bloom's taxonomy (Krathwohl, 2002).

The exam (see Appendix V) was based on the test.grid mentioned above.

The final grade for the student is based on the Dutch grading system using the following formula:  $\left\{ \frac{\text{Student Exam Score}}{\text{Maximum Score}} \times 9 \right\} + 1$  (CITO, 2016).

<u>Dutch Grading System</u> (Nuffic, 2016)	
<u>Numerical grade</u>	<u>Description</u>
10	Outstanding
9	Very good
8	Good
7	More than satisfactory
6	Satisfactory
5	Almost satisfactory
4	Unsatisfactory
3	Very unsatisfactory
2	Poor
1	Very poor

Figure 1. Dutch grading system

## Serious gaming: The Cool Connection

Serious gaming is, according to Susi (Susi, 2007), used for the solution of business problems, to promote transfer and cross fertilisation.

*'The application of gaming technology, process, and design to the solution of problems faced by businesses and other organizations. Serious games promote the transfer and cross fertilization of game development knowledge and techniques in traditionally non-game markets such as training, product design, sales, marketing, etc'* (Susi, 2007)

Simulation and gaming are used, according to Sutcliffe (Sutcliffe, 2015), to deepen the students' understanding and to reflect on the matters learned in the simulation / game.

*'The aim of a simulation is to deepen students' conceptual understanding by working within, and reflecting upon, a representation of a real environment.'*  
*'The dynamic of a simulation may be competitive, whereby students are encouraged either to outperform other students or to achieve a high rating according to criteria set by the simulation. In these cases the simulation is also a game.'* (Sutcliffe, 2015)

Experimental learning cycles like Kolb (Kolb, 1984) and Klabbers' Magic Cycle (see also Appendix IV) (Klabbers, 2009) are examples of single loop learning. Argyris distinguishes single and double loop learning (Argyris, 1991). Double loop learning is asking the question: what mental model(s) drive(s) my single loop learning cycle.

An important transfer (Grol, 2016) is found in figure 1 called 'elsewhere': active approaches in learning and teaching have a positive effect on the learning experience of students, so they will use the learning outcome in other contexts.

Serious gaming (The Cool Connection or TCC) was used for the following educational reasons in this SCF course:

- Applying basic SCF tools (didactical transfer)
- Integration of different (business) departments involved in SCF:
  - Sales
  - Procurement
  - Supply Chain Management
  - Finance.
- Collaboration within each (business) team.
- To experience sub-optimisation at department level versus optimisation at firm (Argyris, 1991) (Argyris, 1991) level (ROI goal in the TCC game).

So, strategic, tactical and operational Supply Chain Finance decisions (Steeman & al., 2015) were made by the teams in this serious game to create consciousness of their strategic behaviour à la Dixit et al (Dixit & al., 1991).

According to the classification of Carmichael (Carmichael, 2005), "The Cool Connection" is definitely a strategic game, it is repetitive (more than one round for each player). Due to the game generator (using Math Lab), teams do not play against each other in this oligopolistic market. The outcome of each simulation round has cooperative and dynamic elements. Increased complexity is managed during the competition, so participants experience enough (simulated) reality.

## Execution

The execution of the course was carried out in the period September 2015 – January 2016. Every week 3 academic hours (45 minutes each) were scheduled. In Appendix III, the detailed weekly planning is presented. In accordance with the plan students were informed what to do before the lecture and after the class. The main idea was that in the first seven weeks the theory of Supply Chain Finance was explained, and in the second seven weeks the application via case studies and participation in the serious game was scheduled. During the last class of the semester an examination was discussed in order to prepare for it.

Slides, hand-outs and copyright of free research papers were available in the electronic learning environment of HAN or as a hard copy during the class.

“The Cool Connection” (The Cool Connection, 2016), is a Supply Chain Finance simulation, and is based on four roles that interact in a company:

- Purchase manager
- Sales manager
- Supply chain manager
- Finance manager

A game generator simulates the behaviour of an oligopolistic market, in which this team of four students performs. Moreover, the game complexity increases during the rounds, and more instruments available for four managers.

## Evaluation

The subject of Supply Chain Finance (including the learning experience of “The Cool Connection”) were evaluated in a two-hour written exam, at the end of the semester.

The results of the written exam are:

- Average score: 69 (out of 100)
- Standard deviation: 12.1
- Students with a pass ( $\geq 5.5$ ): 93%

The results of the written exam are visualised in figure 2.

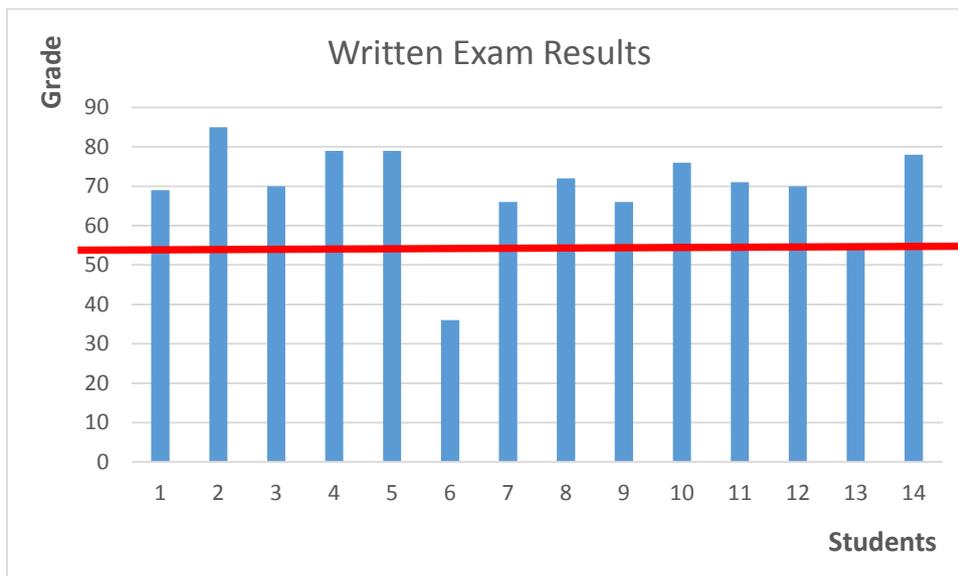


Figure 2. SCF written exam results

So, one of the students did not pass this exam.

Team Name	Round1	Round2	Round3	Round4	Round5	Round6
Team 1	-17.22	-17.22	-14.22	-9.47	-7.71	-6.65
Team 2	-10.99	-10.92	-11.82	-10.74	-7.11	-8.25
Team 3	-15.66	-15.40	-18.66	-18.66	-17.86	-17.86
Team 4	-11.04	-10.92	-11.61	-8.78	-12.76	-12.76
Team 5	-12.14	-12.05	-12.14	-12.50	-12.47	-13.58

Table 1 Final results of "The Cool Connection"

57.1% (8 out of 14) of the students responded to the written evaluation, after the grades of the written exam were published.

		insuffi- cient	suffic- ient	good	very good	Total	Average score	Scor- e
		disagr- ee	agre- e	very agree	strongly agree			10 scal- e
Ques- tion		1	2	3	4			
1	Is it clear to you, what the added value of this subject to your LME study programme is?			3,5	4,5	8	3,6	8,9
2	This module has increased my knowledge of this subject.			1,5	6,5	8	3,8	9,5
3	This module provides practical knowledge and tools taken from the professional field of SCM/SCF		1	2	5	8	3,5	8,8
4	The study materials of this course helped me understand the subject.		2	3	3	8	3,1	7,8
5	The case studies in the field of SCF helped me understand the subject better.		1	5	2	8	3,1	7,8
6	The level of the module is		1	5	2	8	3,1	7,8
7	Does the simulation (TCC) helps you to understand the topic of SCF better?		4	3	1	8	2,6	6,6
8	Was the exam representative for the content of this subject?			2,5	5,5	8	3,7	9,2
9	How many hours per week did you spend on this module on average per week?		Aver- age	5,5				
			St.D ev.	2,2				
						Aver- age	3,3	8,3

Table 2 SCF Student Evaluation

The following questions will be about GOP1-SCF. Please indicate to what extent you agree or don't agree with the following points

	1	2	3	4	5	Avg.	Sd	N
5p: disagree - agree						4.4	0.7	77
- The study guide is useful and clear.						3.9	1.2	11
- This module has increased my knowledge on this subject						4.6	0.5	11
- This module provides practical knowledge tools taken from the professional International Business.						4.5	0.5	11
- This module is relevant to my professional career.						4.4	0.6	11
- The study materials (books, PowerPoints, etc.) of this module helps understand the subject.						4.5	0.5	11
- The exam matches the lectures and reading.						4.6	0.5	11
- The assessment criteria of this module is clear to me.						4.4	0.6	11

Table 3 Student evaluation

Remarks of students:

<i>Student</i>	<i>Remarks (not corrected, original students' texts)</i>
1	<i>Good course in general, gave us clear definitions of supply chain finance terms and the relations with other business management methods. For The Cool Connection game, it would be better to have explanations for the decisions and its possible outcomes in order to get a better insights on the decision making.</i>
2	<i>It would be much better if we could have TCC in more rounds than 6. I can see we can have maybe 12 rounds, because the deeper you go, the deeper knowledge you will dig. From the 6 rounds, there are things which we did change and things like KPI we did not have the chance to change or even to see. The class of SCF is very dynamic but it would be better if it can have more relations with other subject we learn at LME.</i>
3	<i>This topic clearly links supply chain management to other departments. I value a broader knowledge on finance and the management of working capital within the firm. This course opens up a new (for me interesting) way of cooperation within the supply chain.</i>
4	<i>This course was a very good one in my opinion. I learned a lot and feel that the knowledge I gained can be very useful for my future. However, I have the feeling that the beginning of the course was a bit too extensive. We talked about many different definitions of SCF, which was a bit confusing sometimes. I believe it would be enough to spend less time on that and to focus on case studies, calculations and theory.</i>
5	<i>Good course. I never knew the concept of Supply Chain finance even existed. It is a relevant topic and it adds value to my existing knowledge on Supply Chain Management.</i>
6	<i>I hope that the subject will also be taught in the future. I really enjoyed this subject, although I was never highly interested in Finance. This subject did change my mind.</i>
7	<i>No remarks</i>
8	<i>I think it's a great course! Close to the real trends in supply chain, operations and finance. We, as young professionals, have definitely an added value when we can prove that we understand and are able to apply this evolving concept. Besides, the TCC was exciting, since it was all about testing and applying theoretic knowledge from the course to a "real" business (or at least a good simulation). I liked also the focus on literature in this course, which is not the case to that extent for other subjects.</i>
9	<i>This course opened up a new way to cooperate with partners within the sc, which is very interesting. a more in-depth look at finance is also useful.</i>

Table 4 Students' Remarks (SCF evaluation)

## Adjustments

Students show a high level of satisfaction (see tables 2, 3 and 4) of the Supply Chain Finance subject in total: A total grade is 8.3 (on a scale from 0 - 10). However, some points of attention are:

- The study materials.
- The weekly planning (more smoothening, also with LPP and SCOR).
- SCF is a part of SCM / Logistics. And hence, not an isolated subject but interconnected!
- TCC planning on the earlier stage of the programme.

The recommendations were based on the data (see tables 2, 3 and 4) provided by the students as well as by the staff at the LME faculty meeting (LME, 2016).

Some adjustments in the planning of lectures should be carried out:

- SCF concepts should be a bit more concise.
- The period of study of SCF instruments described in the EBA, guide-book (80 pages) should be extended in period 1 and 2, and not be planned in week 7 of period 1.
- Trial round of TCC in lecture 6 of period 1. So, in lecture 7 more feedback on their decision log can be provided to the students.

Each round the students should make a logbook of their decisions, and compare them to the actual outcome in order to learn from their decisions and how cause and effect relationships in “The Cool Connection” are structured.

Supply Chain Finance and “The Cool Connection” should be more integrated (see Appendix VI) with other subjects in the LME study programme like:

- Procurement
- Sales & Marketing
- Supply Chain Management (SCM)
- Warehousing
- Advanced Planning and Scheduling (APS)
- Enterprise Resource Planning (ERP) & Information Technology (IT)
- International finance
- Management accounting
- Economic Trade Offs (ETOs)
- Logistics Policy Plan (LPP)
- Supply Chain Operations Reference model (SCOR)
- Cross Cultural Management (CCM)

## **Conclusion**

Education is an ongoing process. Every time a new course is designed, executed, evaluated and adjusted, new improvements are observed. This new course in the field of Supply Chain Finance in combination with a serious game (The Cool Connection) is not an exception and the job is not finished.

After this first attempt, new courses were delivered to the LME students of HAN Arnhem Business School and a distance learning / intensive course to our international partner in Russia (Chelyabinsk State University).

Having carried out the DEEA<sup>2</sup>- cycle for the third time, some stability of the course is now reached. A new ambition is to write a textbook (with mainstream theory, exercises and case studies).

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<sup>2</sup> Design – Execute – Evaluate - Adjust

## Bibliography

- Argyris, C. (1991). Teaching Smart People How to Learn. *Harvard Business Review*.
- Carmichael, F. (2005). *A guide to game theory*. Harlow (UK): FT Prentice Hall.
- CITO. (2016, May 17). *CITO rounding up algorithm*. Retrieved from CITO:  
[http://www.cito.nl/onderwijs/voortgezet%20onderwijs/centrale\\_examens/normering\\_alg/normeringmethode](http://www.cito.nl/onderwijs/voortgezet%20onderwijs/centrale_examens/normering_alg/normeringmethode)
- Dixit, A., & al., e. (1991). *Thinking Strategically: The competitive edge in business, politics, and every day life*. New York (USA): WW Norton & Company.
- Euro Banking Association (EBA). (2014). *Supply Chain Finance - European market guide*. London (UK): Euro Banking Association (EBA).
- Grol, R. (2016). *Investigating Economic Classroom Experiments*. Nijmegen: Ipskamp Drukkers.
- Hillier, D., & al., e. (2014). *Fundamentals of Corporate Finance*. Maidenhead: McGrawHill.
- Horngren, C., & al, e. (2012). *Cost Accounting*. Harlow (UK): Pearson.
- Inchange B.V. (2016, January 2016). *The Cool Connection*. Retrieved from The Cool Connection:  
<https://www.thecoolconnection.org/>
- Jansen, J. (2016, Maart 17). Case studies Economic Trade Off's . *Case studies Economic Trade Off's*, Arnhem, Gelderland, Netherlands: HAN University of Applied Sciences.
- Jansen, J. (2016). Supply Chain Finance. *Vestnik (Chelyabinsk State University)*.
- Keune, A., & al, e. (2015). *Logistics Management (Economics)*. Arnhem: HAN University of Applied Sciences.
- Klabbers, J. (2009). *The Magic Circle, Principles of Gaming & Simulation*. Rotterdam: Sense Publishers.
- Kolb, D. (1984). *The experiential learning: Experience as the source of learning and development*. New Jersey (USA): Prentice Hall.
- Krathwohl, D. (2002). A Revision of Bloom's Taxonomy: An Overview. *Theory into practice*, 212-218.
- LME, T. (2016, February 1). LME Staff meeting (evaluating semester 7). (J. Jansen, Interviewer)
- Nuffic, E. (2016, May 17). *Education system Netherlands*. Retrieved from NUFFIC:  
<https://www.epnuffic.nl/en/publications/find-a-publication/education-system-the-netherlands.pdf>
- Selfleadership*. (2016, April 26). Retrieved from  
<http://www.selfleadership.com/blog/leadership/reflecting-and-learning-2009-to-2010/>
- Steeman, M. (2016, January 212). Retrieved from Hogeschool Windesheim:  
<http://www.windesheim.nl/onderzoek/deskundigen/michiel-steeman/>
- Steeman, M. (2016, January 31). *The Cool Connection*. Retrieved from  
[www.thecoolconnection.org/education/training/concept/](http://www.thecoolconnection.org/education/training/concept/)
- Steeman, M., & al., e. (2015). *Supply Chain Finance, its practical relevance and strategic value*. Zwolle: Supply Chain Finance Community.
- Susi, T. e. (2007). *Serious games - An Overview*. Skövde (Sweden): University of Skövde.
- Sutcliffe, M. (2015). Simulations, Games and Role-Play. In P. Davies, *The Handbook for Economic Teachers*. Bristol (UK): The Economics Network. Retrieved from  
[https://www.economicsnetwork.ac.uk/handbook/printable/games\\_v5.pdf](https://www.economicsnetwork.ac.uk/handbook/printable/games_v5.pdf)

**Appendix I Curriculum model (Design, Execute, Evaluate & Adjust)**

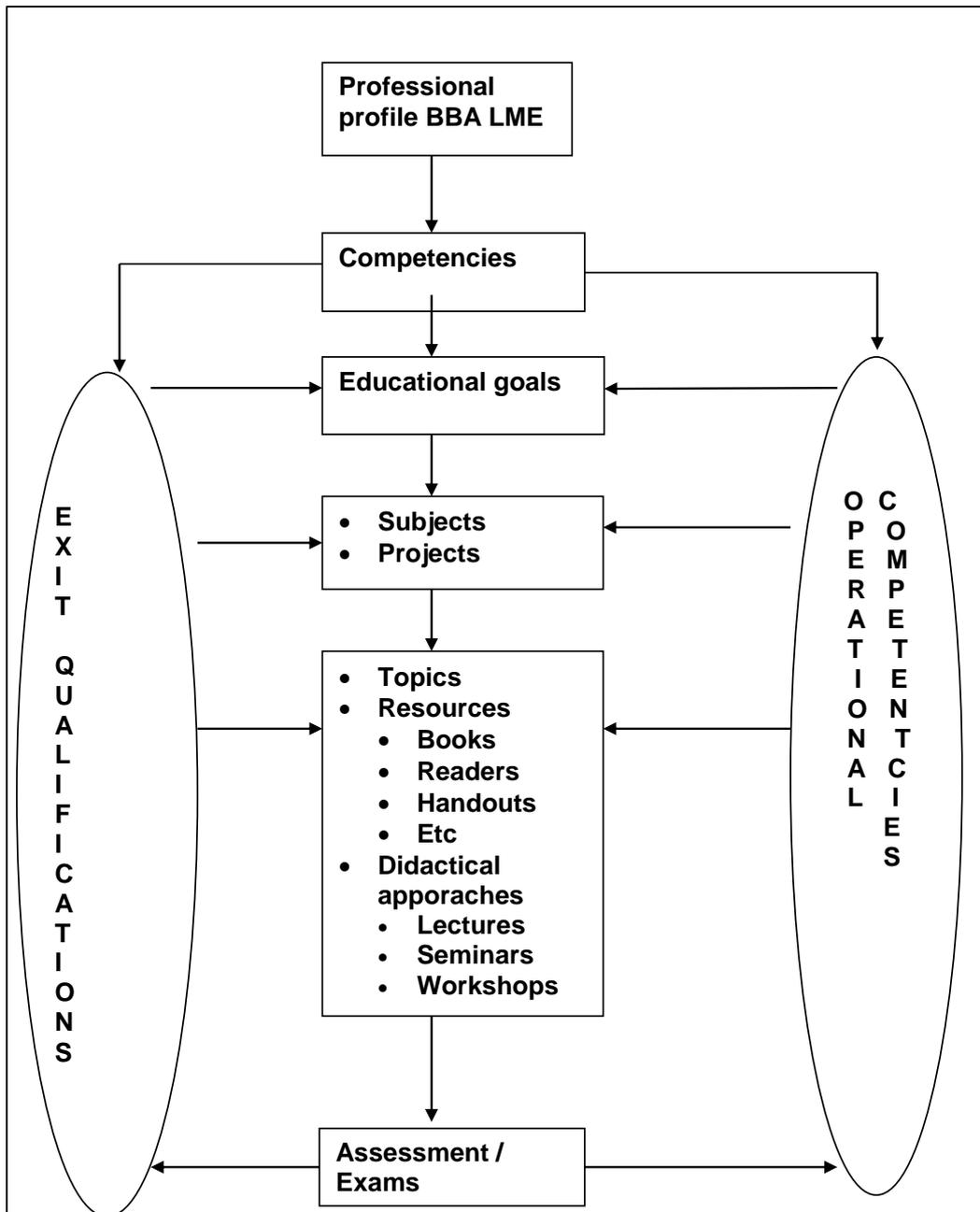


Figure 3. Curriculum model developed by the author

## Appendix II

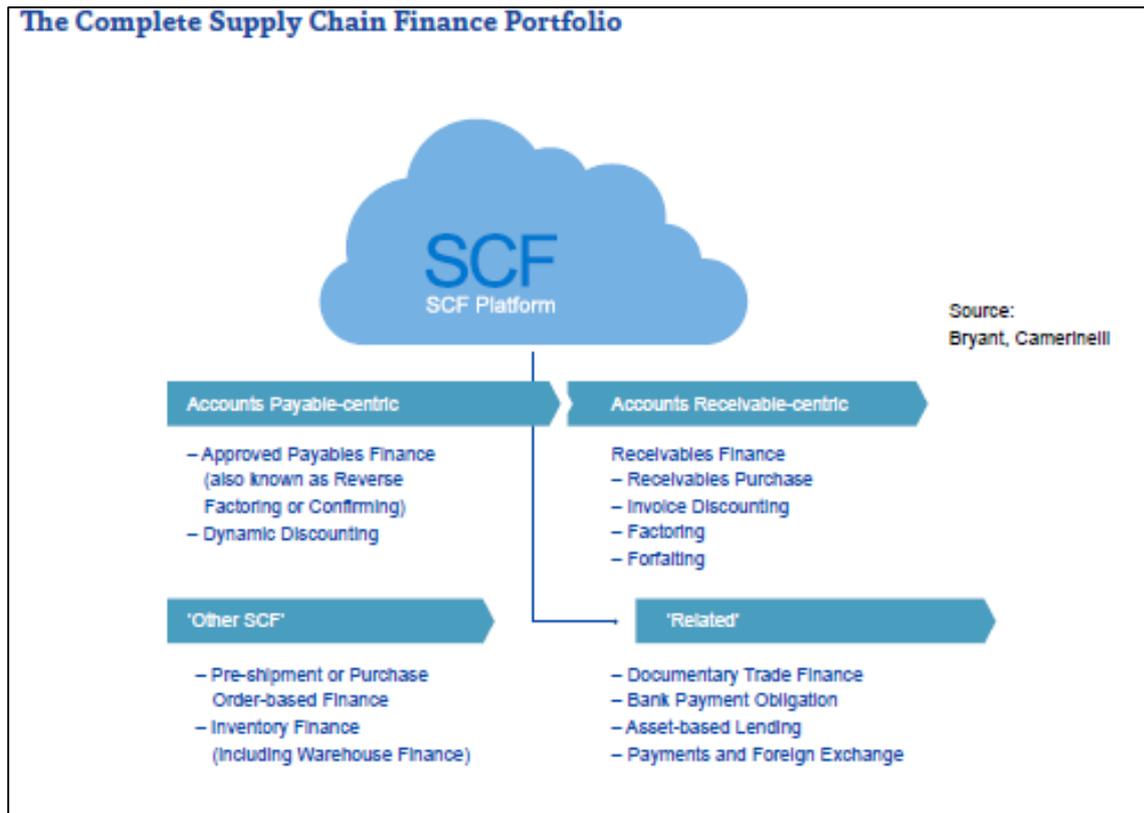


Figure 4. SCF Instruments (Euro Banking Association (EBA), 2014)

## Appendix III

Every week students had a lecture (3 academic hours each). The total workload was 3.75 ECTS or 105 academic hours.

Lecture	Topic	Preparation
1.1	Introduction to SCF & Elements of SCF: SCM, Purchase, APS, ERP and ICT	Video lecture SCF Chapter 1 – 4 The Power of SCF
1.2	Financial ratios	FCF Chapter 3 Annual reports 2014 Unilever, Philips & Heineken
1.3	DuPont Analysis & Value	SCF Chapter 5 & 6 Annual reports 2014 Unilever, Philips & Heineken Case study KPN
1.4	Working Capital	FCF Chapter 17 Case study SCF EU
1.5	Working Capital Management Dynamic Discounting	SCF Chapter 7 & 8 Case study ACCA
1.6	SCF instruments	SCF chapter 9 & 10 Standard definitions for Techniques of SCF
1.7	Risk management in SCF	SCF appendix I & II

Lecture	Topic	Preparation
2.1	Introduction to value Introduction to “The Cool Connection”	SCF Appendix I & II
2.2	CAPM & EVA Cool connection round 0 (test round)	SCF 11
2.3	SCF instruments Cool connection round 1	SCF 12
2.4	Cool connection round 2	Case Heineken
2.5	Cool connection round 3	Case Innopay
2.6	Cool connection round 4	Case Unilever
2.7	Cool connection round 5 Test exam	Exam case Agrifac Exam case: KPN

## Appendix IV

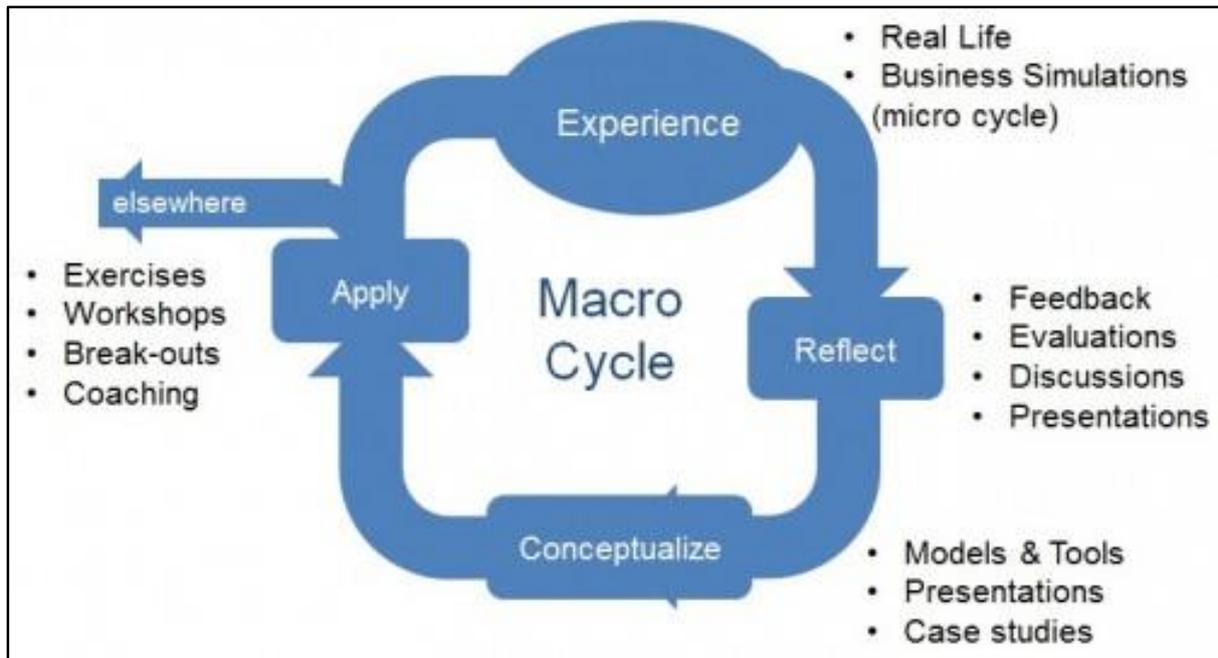


Figure 5. Klabbers' Magic Cycle (Steeman M. , The Cool Connection, 2016)

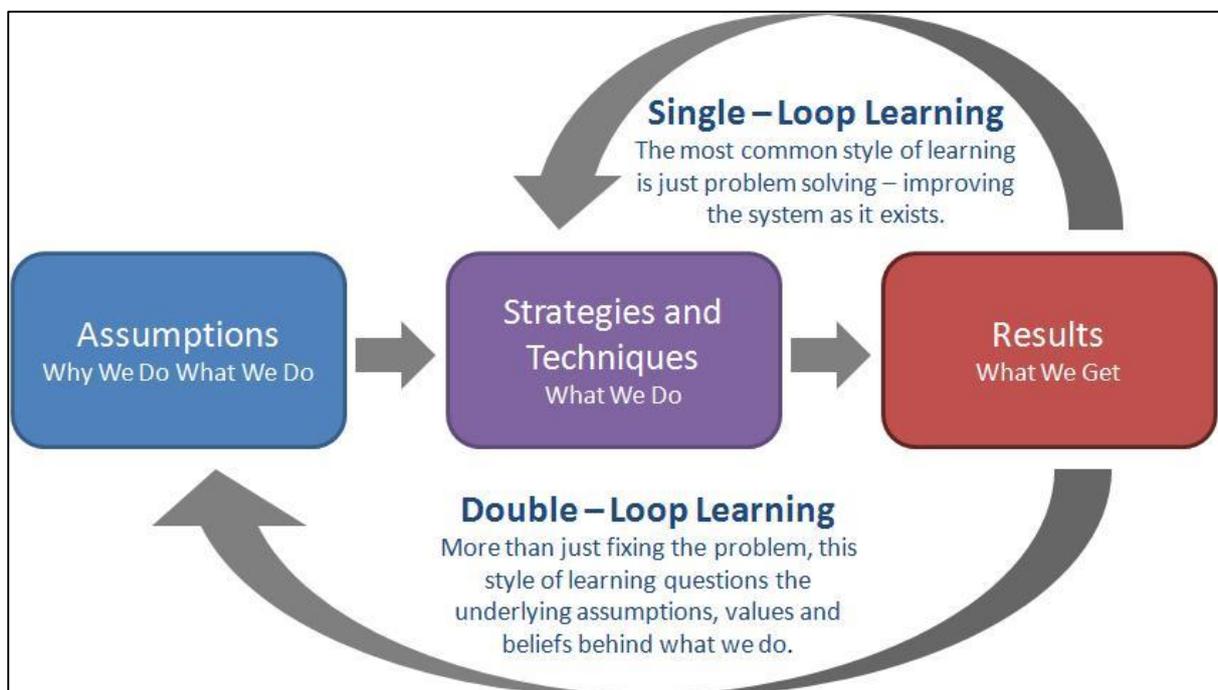


Figure 6. Single and Double loop learning (Argyris) (Selfleadership, 2016)

## Appendix V

### Exam case Supply Chain Finance

(Handed out to the students one week before the exam)

#### **Sweetener for suppliers**

(Source: The Financial Times, 21 October 2009, by Richard Milne)

When KPN, the Dutch telecoms group, last year decided to extend how long it took to pay suppliers it knew it would not be a popular decision. So, as it moved its payment terms from 45 to 90 days, it looked into a mechanism called supply chain finance. “Obviously [the lengthening of payment terms] is a negative thing for suppliers. So we were looking for a sweetener to smoothen the implementation and then we found this,” says Toon Huiskes, a financial manager in KPN’s procurement division.

Supply chain finance is seen by many supply chain experts and managers as the great hope for easing problems with suppliers. Although it actually refers to several different solutions, at its most basic it allows both the buying company and the supplier to improve their working capital – a crucial attribute given the recent financial crisis. Companies such as J Sainsbury, Nestlé, Syngenta, retailer Metro and truck maker Volvo have all used it.

The way it works at KPN is typical. The Dutch group pays its suppliers later, improving its own working capital by holding on to its money for longer.

But suppliers can now access their invoices to KPN on an internet platform and sell them on to a bank as soon as they are approved. That means they can get their money almost three months ahead, against the payment of a fee they need to pay the bank. The bank eventually collects the money from the buyer on the official payment date.

“It supports our supply chain because it is a win-win for everybody,” says Mr Huiskes.

“Win-win” is a term used by many in supply chain finance. Both sides improve their working capital while the banks get a fee. It looks similar to the widely used practice of factoring but the main difference is that the risk is transferred from a group of buyers to one, usually more creditworthy, buyer. It also tends to be cheaper as the supplier essentially uses the buyer’s credit rating, and the risk for the bank is low as the invoices have been confirmed by the buyer.

Supply chain finance has even caught the eye of the Bank of England as it seeks to encourage lending in the real economy. The UK’s central bank is consulting on whether to introduce such a programme itself to help suppliers who are facing

financing problems as banks tighten credit. “The Bank of England is going to be opening the floodgates for supply chain finance,” says Mark Perera, head of the Procurement Intelligence Unit.

But the sunny language of win-win situations belies the difficulties involved in setting up such a scheme. Those challenges in turn demonstrate why, for all the interest in supply chain finance, its application so far has been slower than expected.

The main challenge when introducing supply chain finance is simply to get everybody on board, both internally at the buying company and among suppliers. “You need to cover a lot of angles,” says Mr Huiskes. The treasury, procurement, accounting, IT and accounts payable departments were all involved at KPN.

The problem is that all of the departments speak different languages and have different incentives. “It is like procurement speak Chinese and finance speak English,” says David Brown, head of Oxygen Finance, a start-up attempting to use credit card processes in procurement.

It can also be difficult and costly to roll out globally. Legal and audit issues mean it is tricky to do worldwide while the retrenchment of banks to their national markets means there are few genuinely global institutions left to help set up the schemes. Even if a bank can be found, some worry that they are reticent to push into it because they do not want to give up the larger profits from factoring.

Even banks agree, to a point. Alan Keir, head of European commercial banking for HSBC, says: “If you are an intermediary the issue is: how do you make money?” His colleague, Adrian Rigby, points to the advantage on risk for banks of dealing with buyers rather than suppliers: “On a pure margin side it may not be so profitable, but overall on risk it is more secure.”

Companies also need to invest in infrastructure such as IT and ensure they have efficient processes. That can lead to high set-up costs. But it can help in other ways such as minimising disputes. A supplier can see its invoice – and whether it is correct – long before the technical payment date. “Due to this platform we eliminated a lot of disputes,” says Mr Huiskes.

But suppliers themselves need convincing. Many have fared so badly – such as in the retail and car industries – that they are distrustful of anything proposed by their buying companies. Daniel Corsten, a professor at IE business school in Madrid, calls their worries the “adoption paradox”. He says suppliers that need the finance are the most reluctant to adopt because they fear they might become more vulnerable: “It might mean that you are dependent on your customer not just for business but also for finance.”

Even if they are in favour, companies are tending to extend the scheme to a few select suppliers, which are normally their biggest ones and in less trouble than the

smallest. “There is nothing very supply chain about finance right now,” says Mr Brown.

KPN started out with only its two biggest suppliers and will soon have 25 on board, representing 15 per cent of its total spending. Mr Perera warns: “It needs to be there for the smaller suppliers as well as the big ones.” The irony is that the smallest suppliers are often weaker financially than the big ones to start with, says Prof Corsten.

But despite the imperfections, supply chain finance can be a useful tool for companies to help them and their suppliers. Some companies such as Crédit Agricole and SCF Capital have even applied it to mergers and acquisitions.

Back at KPN, the launch has been a success. “This has been very well received,” says Mr Huiskes. “This is the main game in town now.”

## Questions

1. How is Supply Chain Finance defined in this article? Explain the similarities and differences of the definition of Professor Steeman. **(10 points)**
2. An important aspect of implementing Supply Chain Finance is a good performing IT platform. Explain why a good performing IT platform is so important for implementing Supply Chain Finance. You may use an example to elaborate your line of reasoning. **(10 points)**
3. In the article above a 'Win-Win situation' is mentioned a few times. Explain from a theoretical point of view what determines the Win-Win gains in terms of EVA in the supply chain? **(10 points)**
4. What is the impact of KPN's decision to move the payment terms from 45 to 90 days in the supply chain of KPN? Explain your line of reasoning. You are allowed to use an example to illustrate your answer. **(10 points)**
5. Mention five supply chain instruments. **(5 points)** Explain one of the mentioned supply chain instruments. You are allowed to use an example for the explanation. **(5 points)**

We derive the following data from the KPN annual report 2014<sup>3</sup>:

	<b>2014</b>	<b>2013</b>
Operating profit	1195	1026
Total assets	18556	25872
Total equity	4630	5303
Sales	7999	8443
Inventory	61	60
Debtors (AR)	999	1214
Costs of sales (COGS)	6888	7446

6. Calculate the following sub-questions for 2013 and 2014 (show your calculations!):
  - a. The three elements of the DuPont identity. **(4 points)**
  - b. Days sales in receivables or Average collection period. **(3 points)**
  - c. Inventory turnover period. **(3 points)**

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<sup>3</sup> All numbers are in million Euros

Consider the following financial statement information for the Weijers GmbH:

Item	01-01-2105	2015	31-12-2015
Inventory	€ 44,234		€34,048
Accounts receivable	€ 43,211		€ 35,532
Accounts payable	€ 35,603		€ 53,503
Net sales <sup>4</sup>		€360,302	
Cost of goods sold		€ 120.400	

7. Calculate the operating and cash cycles. **(5 points)** How do you interpret your answer? **(5 points)**

A firm offers terms of 1/10, net 35 (Customers have 35 days from the invoice date to pay the full amount; however, if the payment is made within 10 days, a 1% cash discount can be given).

8. Calculate the following sub-questions (show your calculations!):
- What effective annual interest rate does the firm earn when a customer does not get the discount? **(4 points)**
  - What effective annual interest rate does the firm earn when the discount rate is changed to 2%? **(3 points)**
  - What effective annual interest rate does the firm earn when the credit period is extended to 60 days? For calculations use the original data. **(3 points)**
9. You participated in the supply Chain Finance simulation “The Cool Connection”. What was your role (s) in the game? What was your learning experience in terms of single loop and double loop learning? **(20 points)**

**End of the Exam!**

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<sup>4</sup> Assuming that all sales are made in credit!

## Appendix VI

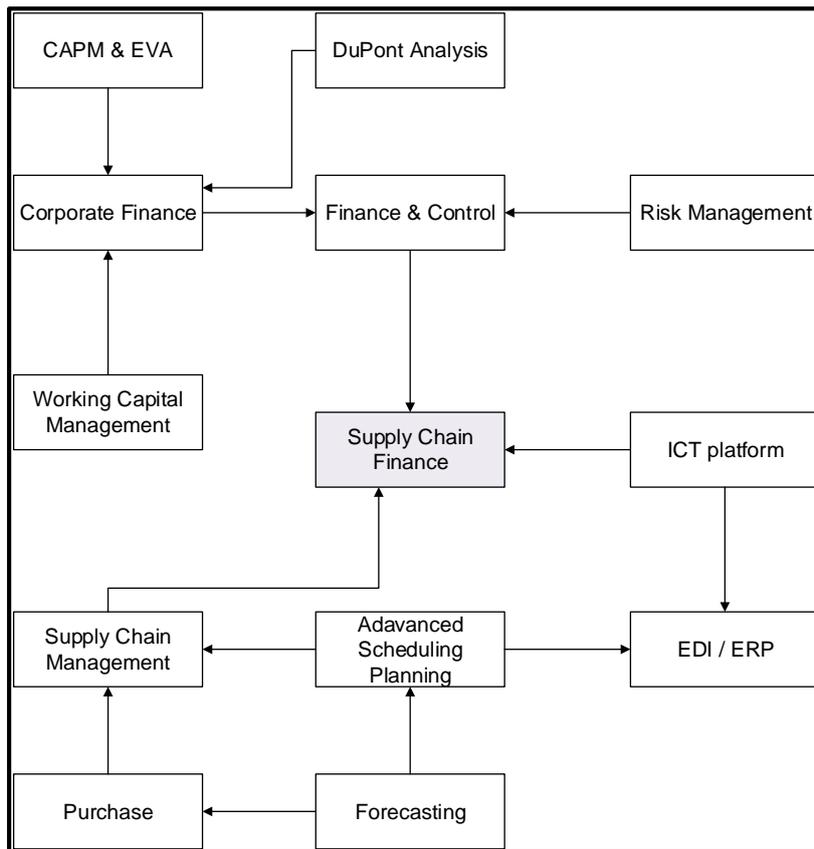


Figure 7. Supply Chain Finance: How it all fits together (developed by JH Jansen (Jansen J. , 2016))