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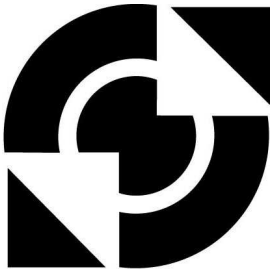


Master Thesis

Motivation in online learning

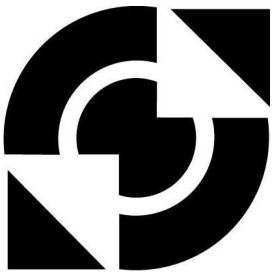
Designing an instrument to measure the motivating effect of online course material

Patricia Brouwer

April 20, 2006

University of Twente

Human Resource Development



Master Thesis

Motivation in online learning

Designing an instrument to measure the motivating effect of online course material

Patricia Brouwer, s9702407

Graduation committee
Dr. J.I.A. Visscher-Voerman
Dr. R.R. Meijer

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Preface

This master's thesis contains the result of my research project that I conducted for the master track Human Resource Development. In the ten months of doing research and writing this thesis, I learned a lot and gained valuable experiences about conducting research. Especially my three-month stay at Utah State University was tremendous in every aspect, as a student as well as personally.

There have been quite some people who helped me with my thesis, I like to thank them here for their time and support! I'm talking about the people who were kind enough to act as respondents for the interviews, the people who arranged access to their online courses and the people who helped me find respondents. Some people I would like to mention personally:

Joanne Bentley and Max Cropper from Utah State University for letting me participate in your research project and helping me with my research, John Keller for giving me very valuable criticism. Last, my mentors Rob Meijer and Irene Visscher-Voerman for your feedback and positive approach which was very motivating!

Finally, a big thanks to Aki, YB, Hans & Leni and Ger.

Summary

Good instructional design is essential for a successful online course. This design should also include motivation of the online learner. Because of the nature of online learning, the motivation of the learner is an important aspect because there is no face-to-face communication with the instructor or fellow learners. With this in mind, it is important that motivational elements are included in online course material.

This research is aimed at determining the predictive value of an instrument which is designed to measure the motivating effect of online course material. The research consists of three parts:

- Designing a conceptual framework from theory
- Designing an instrument to measure the motivating effect of online course material
- Determining the quality of the instrument

The research started with an exploration of the concept motivation in literature. Motivation, online learning and adult learning have been examined. On the basis of this exploration it became clear that the four elements of the ARCS Model of Motivational design were most appropriate to serve as a basis for the instrument. The four elements are Attention, Relevance, Confidence and Satisfaction. The exploration resulted in a conceptual framework. From this framework, the items of the instrument have been selected and constructed. This resulted in the design of the instrument.

Next, the quality of the instrument has been determined by employing quantitative as well as qualitative research activities: an evaluation with seven American online courses, the determination of the inter-rater reliability, an expert evaluation and an evaluation with online learners from four Dutch online courses.

1. The evaluation with the American online courses resulted in an adjustment of the items to define them more clearly and objectively.
2. The determination of the inter-rater reliability showed that the inter-rater reliability was substantial.
3. The expert evaluation resulted in the need for qualitative data from the viewpoint of the online learner. This led to a new activity, an evaluation with online learners.
4. The evaluation with the online learner showed that the outcomes of the online learners regarding the motivating effect of the four Dutch online courses are different from the outcomes of the instrument. These results need to be considered with care, because of the low number of respondents per course.

After studying the results of the four research activities, the research question has been answered. What is the predictive value of the instrument which is designed to measure the motivating effect of online course material? From the results, it has become clear that the predictive value of the instrument is weak. Another conclusion is that the instrument is not a measurement instrument. There is no connection between the number of items present in an online course and the motivating effect of that course. The instrument can have an added value as a job aid for designers, because it gives an overview of motivational tactics specific for online learning. The instrument is renamed “ARCS-based motivation tactics list for online course design”.

Samenvatting

Voor een succesvolle online cursus is een solide onderwijskundig ontwerp essentieel. Dit ontwerp dient ook het motiveren van de online cursist te bevatten. De karakteristieken van online leren maken de motivatie van de online cursist tot een belangrijk aspect. Er is namelijk geen face-to-face communicatie tussen en met de instructeur en mede-cursisten. Met dit in gedachten, blijkt het belangrijk om motivationele elementen toe te voegen aan online cursusmateriaal.

Dit onderzoek heeft tot doel het vaststellen van de voorspellende waarde van een instrument wat ontworpen is om het motiverende effect van online cursusmateriaal te meten. Het onderzoek bestaat uit drie delen:

- Het ontwerpen van een conceptueel raamwerk uit de theorie
- Het ontwerpen van een instrument om het motiverende effect van online cursusmateriaal te meten
- Het vaststellen van de kwaliteit van dit instrument

Het onderzoek begint met een literatuuronderzoek naar het concept motivatie. Motivatie, online leren en adult learning zijn onderzocht. Aan de hand van dit onderzoek werd duidelijk dat de vier elementen uit het ARCS Model of Motivational Design het meest geschikt waren als basis voor het te ontwerpen instrument. De vier elementen zijn Aandacht, Relevantie, Vertrouwen en Voldoening. Het literatuuronderzoek resulteerde in een conceptueel raamwerk. Vanuit dit raamwerk zijn de items voor het instrument gekozen en geconstrueerd. Dit resulteerde in het ontwerp van het instrument.

Vervolgens werd de kwaliteit van het instrument vastgesteld door zowel kwantitatieve als kwalitatieve onderzoeksactiviteiten te ondernemen: een evaluatie met zeven Amerikaanse online cursussen, het vaststellen van de inter-codeur betrouwbaarheid, een expert-evaluatie en een evaluatie met online cursisten van vier Nederlandse online cursussen.

1. De evaluatie met de Amerikaanse online cursussen leidde tot aanpassingen van de items van het instrument, om ze duidelijker en meer objectief te formuleren.
2. De bepaling van de inter-codeur betrouwbaarheid liet zien dat de inter-codeur betrouwbaarheid substantieel was.
3. De expert evaluatie leidde tot een behoefte aan kwalitatieve gegevens vanuit het gezichtspunt van de online cursist. Dit leidde tot een nieuwe onderzoeksactiviteit, een evaluatie met online cursisten.
4. De evaluatie met de online cursist liet zien dat de uitkomsten van de cursisten afweken van de uitkomsten van het instrument betreffende het motiverende effect van vier Nederlandse online cursussen. Deze resultaten moeten met enige zorg worden geïnterpreteerd wegens het lage aantal respondenten per cursus.

Na beschouwing van de resultaten van de vier onderzoeksactiviteiten is de onderzoeksvraag beantwoord. Wat is de voorspellende waarde van het instrument wat ontworpen is om de motiverende werking van online cursusmateriaal te meten? Uit de resultaten is gebleken dat de voorspellende waarde zwak is. Een tweede conclusie is dat het instrument geen meetinstrument is. Er is geen connectie tussen het aantal aanwezige items in een online cursus en het motiverende effect van deze cursus. Het instrument kan een toegevoegde waarde hebben als job aid voor ontwerpers, omdat een overzicht biedt van motivationele tactieken gericht op online leren. Het instrument heeft de niewe naam: “ARCS-based motivation tactics list for online course design”.

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1. Introduction

1.1 Research motive

For online courses to be successful, not only proper instructional design is important but also motivation of the learner. This does not only apply to online courses but to adult learning in general. Motivation is a necessary condition for learning (Wlotkowski, 1984). The motivation to participate, to learn and to use what is learned to improve performance determines for a large part the success of HRD programs (DeSimone, 2002). The design of a course can be of such high quality, when learners are not motivated they will not achieve their learning goals (Holmberg, 1995). Keller (1983) also indicates that the assumption that motivation takes care of itself if instruction is of good quality, is only partly true. Some distance educators estimate that 30-50% of all students who start a distance education course drop out before finishing (Cornell & Martin, 1997). In addition, certain characteristics of online learning ask for a focus on motivation of the learner. There is no or little direct communication with instructors and fellow learners, there is a lack of group dynamics and there is no physical learning environment present. Another interesting point is that motivation of learners can change over time, sometimes in unpredictable ways. In traditional classroom learning the instructor can make appropriate adjustments, but in online learning continuous adjusting is not possible (Keller, 1999). These issues show that the inclusion of motivational elements in online courses is an essential aspect.

This master's thesis aims at developing an instrument to measure the motivating effect of online course material. In order to do this, an instrument will be designed. The main question that this thesis will try to answer is:

What is the predictive value of the instrument which is designed to measure the motivating effect of online course material?

1.2 Research process

In the previous paragraph the goal of this thesis has been mentioned briefly. This paragraph describes the research process that was conducted in order to give the reader more insight in the course of this research. On the basis of the research process, the research questions will be described along with the research activities that were carried out with those questions in mind.

This master's thesis started as being embedded in a research project at Utah State University which focussed on finding general design principles for ten online courses that are viewed as of high quality. The main question that this research tried to answer is, to what degree do ten online courses perceived as of high quality by professional organizations and higher education institutions employ Merrill's first principles of instruction? According to a preliminary exploration of literature, an addition of a motivational aspect to Merrill's first principle with regard to online course quality proved valuable. As a result of this, the initial research question was: to what degree have motivational elements been integrated in ten online courses perceived as of high quality by professional organizations and higher education institutions? The first phase

was to design an instrument that was able to measure the degree in which motivational elements were integrated in online courses. Because the USU research had access to course environments only, the instrument focussed on the evaluation of online course material. Participants and instructor were excluded. Research activities that were employed in this phase, are the following:

1. Exploration of the concept motivation from the perspective of motivation theories, online learning and adult learning, resulting in a conceptual framework.
2. Selecting items from the framework and reformulating the items into measurable constructs, resulting in a concept version of the instrument.
3. Pilot testing of the instrument using one American online course, including a check of inter-rater reliability, resulting in a revision of the instrument.
4. Expert evaluation of the revised instrument, resulting in the final instrument.
5. Evaluation of the American online courses with the instrument.

The evaluation of the American online courses led to results which were not as valuable as expected. The quality of the instrument was relatively unknown. This is also one of the main issues of the expert review. Also, the focus was on online course material only and the perspective of the online learner was underexposed. Reflecting, these concerns led to the addition of a second research phase, in which the quality of the instrument played a larger role. The new research question reads, what is the predictive value of the instrument which is designed to measure the motivating effect of online course material? Research activities that were employed in this second phase were aimed at validating the instrument. They are the following:

1. Interviews with online learners which were enrolled in four Dutch online courses.
2. Evaluation of the same four Dutch online courses with the instrument.
3. Comparison of the results of the instrument and the evaluation with the Dutch online learners.

The results of these additional research activities make it possible to pass judgment about the quality of the instrument.

To summarize, the research process consisted of two phases. Phase one is the design of the instrument, along with the research activities that were undertaken in order to answer the initial research question. Phase two is determining the quality of the instrument, along with the research activities that were undertaken in order to answer the new research question. It is important to point out, that the research activities that were conducted in the first phase, were done with the purpose of answering the first research question. Had the researcher assumed the second research question from the start, other research activities would have been carried out. To deploy all the research activities as much as possible to serve the second research phase, the remainder of this master's thesis will be written from the perspective of this latter question.

1.3 Relevance of this research

Now that the research process has been explained, it is important to discuss the significance of this research. What is the relevance of this master's thesis and for whom can it serve a useful purpose? These questions will be answered in this paragraph.

With regard to the concrete proceeds, this research hopes to provide a conceptual framework of motivation regarding online learning and in addition a quality instrument to measure the motivating effect of online course material. With regard to the conclusions, the conclusions will provide insight in the main research question, what is the predictive value of the designed instrument? More detailed, the conclusions will hopefully provide insight in three matters. The first matter is the quality of the instrument. On the basis of the conclusions,

judgement can be passed about the ability of the instrument to measure the motivating effect of online course material. The second matter is the value of existing motivation theory. Conclusions about the added value of this research will be stated. This thesis might be able to formulate additional factors which influence the motivation of the learner, in addition to existing factors as defined in theory. A third matter is the strength of this type of instrument for this kind of research. Conclusions will be made about the choice of instrument and the possibilities for measuring subjective constructs like motivation in research.

With these proceeds in mind, the research is relevant for the following parties. The first party are the designers of online courses. For the designer it is useful to have insight in elements which influence the motivation of the online learner. This way, he/she can include those motivating elements in the course design for this has an effect on the success of the course. The instrument as well as the conceptual framework can provide insight in what these motivating elements are. The second party is the consumer, the business or institution which buys online courses in order to train or educate their employees or students. For this party, the instrument could prove useful in the search for a suitable online course. By using the instrument, the consumer can choose a motivating course. Also, the consumer can use the instrument to evaluate courses that they already use to check if motivating elements are present in the course material. The third party are course instructors. With regard to the conceptual framework of motivation, instructors can gain more insight into the motivational aspects of their online instruction and use these aspects more consciously and effectively. It may also help online instructors gain insight in the benefits of motivational elements and may help them to improve learner motivation in order to achieve the goals of their learners. Furthermore, when online instructors are responsible for selecting their own courses they can base their decision on the degree of motivational elements present. Finally, when online instructors want to evaluate their online courses they can use the designed instrument in addition to a regular student evaluation. Fourth and more indirect, this research can be useful for students that are enrolled in online courses. When instructional designers include motivational elements in their courses, this is a positive development for students because the quality of courses will improve in the long run. Students can also benefit from the insight that instructors have in learner motivation.

What is the additional value of this master's thesis? Firstly, motivation theories are often directed at traditional classroom learning. This thesis provides a conceptual framework that can also be used for online learning directed at adults. This is an addition to existing motivation theories. Related to this, this research provides additional motivational elements directed at online learning. Existing theories mostly mention motivational elements directed at traditional learning. As an addition to these theories, this master's thesis is able to provide additional elements which influence the motivation of the learner. Secondly, motivation is an actual topic because online learning is playing an increasingly significant role in adult education. Some of the existing research focusses on computer-based instruction (which uses a computer but no internet technologies such as email and chat) which does not consider the specific qualities of online instruction. Mostly, this research is dated. This thesis gives a current contribution to this actual topic. Another additional value is that in this master's thesis motivational elements are converted to measurable constructs. Any interested party can use the instrument to measure the degree of motivation of an online course. This way, motivation becomes more concrete and easier to assess.

1.4 Preview of content

This master's thesis consists of six chapters, from which the current chapter is the introduction chapter. The second chapter consists of an exploration of the main concepts of this thesis, motivation and online learning. This results in a conceptual framework. The development and design of the instrument is described in chapter three. Chapter four goes into the research methods used to determine the quality of the instrument. In chapter five, the results of the research activities are described and in the sixth chapter, the main research question will be answered along with the discussion of some final considerations.

2. Motivation and online learning: an exploration of theory

In the introduction chapter, the main research question has been described. In this chapter, the concepts related to this question, motivation and online learning, will be discussed in paragraph 2.2 until 2.5. By exploring the theory, this chapter hopes to provide useful insight in the meaning of these concepts and their relation to each other. This will result in a conceptual framework in paragraph 2.6, which addresses the concept of motivation from the viewpoints of motivation theories, online learning and adult learning. This framework eventually serves as a basis for the construction of the instrument. Before this, paragraph 2.1 will go into the search strategy that was employed in order to find relevant resources.

2.1 Literature search strategy

The theoretical exploration has been carried out using the available sources of Utah State University and University of Twente. For this exploration, three main sources were used: the library online catalogue, the article databases and electronic journals. The first step of the search strategy consisted of defining the main concepts related to the master's thesis topic, which were motivation, online learning and adult learning. The second step has been listing keywords that described the concepts in order to search the available sources. Examples of keywords that have been used are: online learning, online instruction, online education, distance learning, e-learning, adult learning, adult learner, self directed, motivation, motivation design, motivation strategies, motivation instruction, arcs, arcs model, intrinsic motivation, extrinsic motivation. The third step was searching the sources using the keywords or a combination of keywords with Boolean operators. The strategy was to search broad and general at first (which resulted primarily in books) and more specific and up-to date later on (which resulted in articles, electronic journals and dissertations). Next to this, references from articles, journals and dissertations, as well as the World Wide Web and tips from experts were also used as a source. Now that the search strategy has been discussed, the next paragraphs will describe the exploration of concepts.

2.2 Exploration of motivation in motivation theories

In this paragraph, the ARCS Model of Motivational Design is explored in detail. Although a variety of motivation theories related to the educational field exists, the main focus has been on the ARCS Model of Motivational Design from the start. During the preliminary exploration of theories within the framework of the research plan, it became clear that the ARCS Model of Motivational Design was most suitable to serve as a basis for the conceptual framework. One argument is that the ARCS Model of Motivational Design specifically focusses on the motivational design of learning interventions and provides a practical basis which other theories lack. Another argument is that the ARCS Model of Motivational Design provides motivational tactics, aimed at improving the motivation of the learner. These tactics seem very useful as a basis for the design of the instrument. Most theories focus on motivation as an internal state but do not provide a practical link with the design of learning interventions. This makes them less appropriate to use in this research. With these arguments in mind, the following paragraph focusses on the ARCS Model of Motivational Design only.

2.2.1 ARCS Model of Motivational Design

According to Keller (1998), people will be motivated to undertake action if it gives them personal satisfaction and if they have a chance to be successful. Keller's ARCS Model of Motivational Design is a systematic approach for designing motivational interventions. Three assumptions underlie this systematic motivational design. The first assumption is that it is possible to influence people's motivation. Effective teachers can inspire motivation by giving motivating feedback, through individual behaviour and role modelling. The second assumption is that motivation in relation to performance is a means and not an end. Optimal motivation for performance means that people have feelings of challenge, satisfaction and competence. The third assumption is that systematic design can influence motivation in a predictable way. What is motivation exactly? According to Keller, motivation refers to the choices people make as to what experiences or goals they will approach or avoid, and the degree of effort they will exert in that respect (Keller, 1983). Motivation is correlated with the three concepts effort, performance and consequences. Figure one (Keller, 1983) shows how these concepts are linked together.

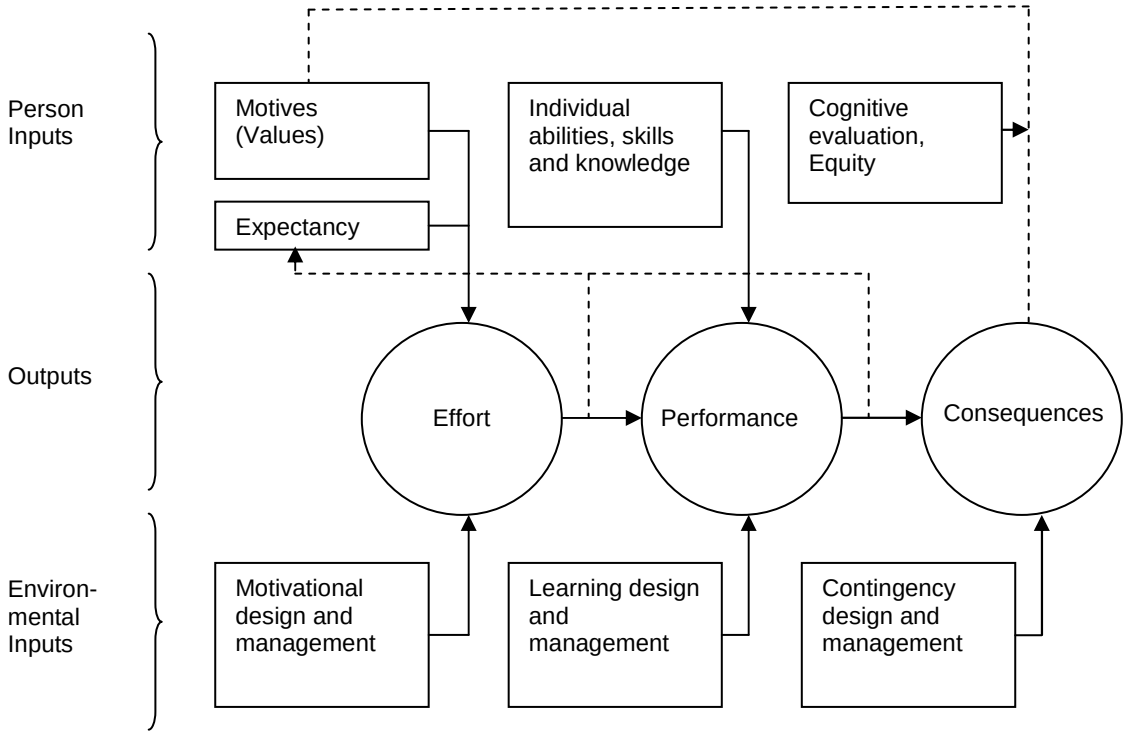

Figure 1. A model of motivation, performance and instructional influence

Effort is a direct indicator of motivation and it refers to whether the individual is engaged in actions which are aimed at accomplishing a task. Effort is influenced by motives and expectancies. An individual will approach activities or goals that are perceived to be personally satisfying and for which the individual has a positive expectancy of success. Performance is a measure of learning and is indirectly related to motivation and refers to actual accomplishment. Performance is also influenced by ability and opportunity. An individual both needs the opportunity and the necessary abilities to be able to perform. Consequences are intrinsic and extrinsic outcomes, such as emotional or affective responses and social rewards. Consequences

are related to motivation through cognitive evaluation, which influences personal motives or values. As can be seen in figure one, the two primary areas of influence on motivation are person inputs and environmental inputs. Person inputs are individual characteristics of human motivation, such as motives, individual abilities, skills, knowledge and cognitive evaluation. Environmental inputs refer to instructional design which can influence motivation, such as motivational design, learning design and reinforcement-contingency design. Any instructional event has these three influences. Now that there is a clear understanding of motivation and the concepts related to motivation, Keller's ARCS Model of Motivational Design will be discussed next.

Keller developed a model for including motivational elements in course design. He defined four elements in his ARCS Model of Motivational Design (Pieters & Warries, 1992 and Keller, 1983): Attention, Relevance, Confidence and Satisfaction.

The first element is Attention, which is about engaging and maintaining learner interests and curiosity. Interest is a condition that exists when there is an unexpected or inconsistent event in the perceptual environment, or when there is a gap between a given and a desired state of knowledge. Examples of strategies to increase learner interest and curiosity are (Keller, 1983):

- Use novel, surprising, incongruous or uncertain events in instruction
- Use anecdotes and other devices
- Use analogies to make the strange familiar and the familiar strange

The second element is Relevance, which is about relating course content to learner interest and needs. For motivation to be sustained, it requires the learner to perceive that important personal needs, motives or values are being met by the learning situation or a specific task. Examples of strategies to increase Relevance are (Keller, 1983):

- Show how the instruction relates to what the learner already knows
- Use concrete language and use examples and concepts that relate to the learner's experience and values
- Present goals for accomplishment or have the learner define them

The third element is Confidence, which is about enhancing learner confidence in understanding course content. Personal motivation will tend to increase when the personal expectancy for success increases. Personal expectancy for success is influenced by three elements: past experience with success or failure at a given task, locus of control (a person's perceived internal versus external control over reinforcements) and personal causation (the personal conviction that one can execute the behaviour required for successful performance). Examples of strategies to increase expectancy for success are (Keller, 1983):

- Use instructional design strategies that indicate the requirements for success
- Make learners aware of performance requirements and evaluative criteria
- Use attributional feedback which helps learners to connect success to personal effort and ability

The fourth element is Satisfaction, which is about encouraging learners' active involvement in learning and managing intrinsic and extrinsic reinforcement. Examples of strategies to increase satisfaction with the instruction are (Keller, 1983):

- Reward accomplishment by using positive feedback
- Use motivating feedback following the response
- Provide the opportunity for learners to use the new skills and knowledge learned during the course

2.2.2 Conclusion

As was explained in the introduction, this master's thesis has focussed on the ARCS Model of Motivational Design from the start. From this exploration of motivation theories there can be concluded that the ARCS Model of Motivational Design will serve as a basis for the conceptual framework. The four elements Attention, Relevance, Confidence and Satisfaction will play a central role in this framework.

2.3 Exploration of motivation in online learning

The previous paragraph discussed motivation from the viewpoint of motivation theories. This paragraph explores motivation from the viewpoint of online learning and will focus on the modified ARCS Model of Motivational Design (Cornell & Martin, 1997) and the considerations of Visser (1998). These theories consider motivation in the online classroom and in distance learning and therefore are relevant to this master's thesis.

According to Cornell and Martin (1997), the difference between dropping out and completing an online course has everything to do with motivation. Learner success to complete a distance learning course is influenced by three factors: the intention to complete the course, early submission of work and completion of other distance courses. Other components that influence learner motivation are course design, the degree of interaction that is provided and available and the role of the instructor. The modified ARCS Model of Motivational Design considers motivation in online learning and is strongly based on Keller's ARCS Model of Motivational Design. The four components are Attention, Relevance, Confidence and Satisfaction. Below, the four components are described in more detail:

The first element is Attention. According to Cornell & Martin (1997), online learning is mostly individual and can therefore depersonalize the instructor-learner relationship. Learners work independent of each other and have to do without face-to-face interaction with fellow learners and the instructor. This can affect learner attention in a negative way, since learning is a social activity. Content in the online learning environment must be presented in such a way that it motivates the student to attend to the information.

In addition, Visser (1998) points out that with online learning it is more difficult to attain and hold the attention of the learner. Although there is an initial interest of the learners (when they receive the new course material and there is the challenge of starting something new), this interest fades away quickly. Examples of tactics are:

- Send the material not all at once to the learner but in parts after the learner finished a part
- Use various media
- Send motivating messages occasionally

The second element is Relevance. According to Cornell & Martin (1997), the choices involved in instructional decision making are constrained by the nature of online learning. The level of relevance a student attaches to instruction differs as a result of individual background and personal interests. It is important to use applications to promote learning and provide multiple choices. To increase relevance, the learner's prior knowledge can be used and personal connections to the content need to be stimulated. Without choice, learners will be less likely to find relevance in the information to be learned.

In addition, Visser (1998) points out that online learning providers should indicate what learners can expect from the course and which services are offered. Learners should also know what is expected from them. For many learners the course is not immediately relevant so it's important to help learners to get an idea how the course can contribute to solve the (professional) problems they are facing or how the course can enrich their performance. Examples of tactics are:

- Inquire if the learner thinks the course has contributed to better performance after the first assignment
- Give examples (especially in feedback) that relate to the learner's daily circumstances
- Explaining in detail why the learner has to do certain things

The third element is Confidence. According to Cornell & Martin (1997), the absence of a physical classroom is a challenge for the online instructor to provide a climate that supports learning. Courses that lack clear structure and organization could damage the development of learner confidence. Coherently, not all learners have the same opportunity to develop confidence with online learning. When learners have experience and know what they are expected to learn they will begin to develop self-confidence. This process can be facilitated by the online instructor by providing clear structures and reasonable pacing expectations.

In addition, Visser (1998) points out that fear of failure can be strong in online learning, especially for learners who have failed before or are starting their first course. Confident individuals tend to attribute their success to their ability and effort, while this is not the case with insecure people. Learners should be informed in detail what is expected of them. Measuring performance and grading the learner's work should be defined clearly. Examples of tactics are:

- Encourage learners to send in their first assignment early
- Introduce feedback loops that allow learners to catch up or to improve
- Providing opportunities for students to be successful

The fourth element is Satisfaction. According to Cornell & Martin, the lack of face-to-face meetings in online courses makes it difficult for the online instructor to understand and encourage the learners based upon their personality types. Motivating learners to continue learning can create satisfaction when the learning experience itself is enjoyable and fulfilling for learners. It is important that learners are made aware of how much they have learned so that the time they spent on learning is not considered a waste.

In addition, Visser (1998) points out that in online learning, the long term perspective of being satisfied at the end of the course when completed successfully, is not enough. Tactics should aim at making learners feel satisfied more frequently. Examples of strategies are:

- Provide frequent, timely and adequate feedback
- Let learners know how far they have come already
- Include personal satisfaction remarks

2.3.1 Conclusion

This exploration of motivation in online learning shows that the four components of the ARCS Model of Motivational Design can also be applied to online learning. The four components are all relevant, although their initial meaning is changed because of the different characteristics of online learning in comparison with traditional learning. Some of the original strategies therefore need to be changed or adjusted to online learning.

2.4 Exploration of motivation in adult learning

Motivation in adult learning is the third viewpoint that is discussed in this theoretical exploration. Motivation plays a significant role in adult learning theories because learner motivation is often viewed as a condition for learning. Next to this, adult learning is relevant because this thesis focusses on online learning directed at adults. In this paragraph, three adult learning theories will be discussed, Andragogy, CAL Model and Experiential Learning. These theories have been chosen because they give a full overview of the field of adult learning. This is necessary for the design of the conceptual framework.

2.4.1 Andragogy

One way of looking at adult learning is to recognize that adults have special needs and requirements as learners. The adult learning theory Andragogy builds on this concept. Adults are self-directed and take responsibility for the decisions they make. Adult learning programs have to anticipate this. For the design of learning, the following guidelines are important (Knowles, 1980, 1990): adults need to know why they need to learn something; adults need to learn experientially; adults approach learning as problem-solving; adults learn best when the topic is of immediate value; adults are motivated to learn as they experience needs and interests that learning will satisfy; adults' orientation to life is life-centered, therefore the units for organizing adult learning are life situations, not subjects; experience is the richest resource for adults' learning, the core methodology of adult education is the analysis of the experience; adults have a deep need to be self-directing, the role of the teacher is to engage in a process of mutual inquiry with them rather than to transmit his knowledge to them and evaluate their conformity to it; individual differences among people increase with age: adult education should make optimal provision for differences in style, place, time and pace of learning.

At the basis of these guidelines are five principles of adult learning (Knowles, 1978, 1980, 1990).

1. The first principle is self-concept. Adults need to be involved in the planning and evaluation of their instruction. The adult needs to be self-directed.
2. The second principle is experience. Experience (including mistakes) provides the basis for learning activities. This means an increasing emphasis on experiential techniques which tap the experience of the learners and involve them in analyzing their experience.
3. The third principle is readiness to learn. Adults are most interested in learning subjects that have immediate relevance to their job or personal life. Readiness can be stimulated through self-diagnostic procedures.
4. The fourth principle is orientation to learning. Adult learning is problem-centered rather than content-oriented.

5. The fifth principle is motivation. Adults need to be motivated to learn. Adults are motivated to keep on growing and developing but barriers can be negative self-concept as a student, inaccessibility of opportunities or resources, time constraints, programs that violate principles of adult learning.

With regard to online learning, Knowles suggests a number of characteristics needed in online learning interventions designed for adults (Simonson, Smaldino, Albright & Zvacek, 2003). The first characteristic is that the psychological environment should be one that promotes respect and dignity for the adult learner. A second characteristic is that the needs and interests of the adult learner should be the starting point of the course, or a module of the course. A third one is that course plans should include clear course descriptions, learning objectives, resources and timelines for events. A last characteristic is that active participation should be encouraged, such as by the use of work groups, or study teams.

Concerning adult learning, Moore & Kearsley (1996) explain the differences between the needs of children and the needs of adults (pedagogy versus andragogy) with regard to learning. While children trust the teacher to define course content, adults need to define it for themselves, or at least to be persuaded that it is relevant to their needs. While children accept a dependent relationship with a teacher, adults have a sense of self-direction and personal responsibility. Children have little personal experience to draw on, but adults have a lot, which they appreciate being used as a learning resource, and resent being ignored in favour of other people's experiences. Children will accept the teacher's decisions about what to learn, when, where and how. Adults like to make such decisions for themselves or at least be consulted. Children must acquire a lot of information as the basis of life in the future. For adults, the future is now; they have a basis of information and see learning as necessary for using it in solving problems in the present.

2.4.2 CAL model

Another view on adult learning focusses on characteristics of adult learners. The CAL model (Characteristics of Adults as Learners) provides guidelines for adult education programs. For every adult, personal characteristics and situational characteristics differ. Different learning programs are necessary for each adult to support the difference in characteristics. Personal characteristics include the following (Cross, 1982).

1. The first characteristic is aging. Aging results in the deterioration of sensory-motor abilities like eyesight, hearing and reaction time. Intelligence abilities such as decision making skills, reasoning and vocabulary tend to improve over time.
2. The second characteristic includes life phases and developmental stages, for instance marriage, job changes and retirement. These transitions are in some cases related to age.

Next to personal characteristics, there are two situational characteristics (Cross, 1982).

1. The first characteristic is part-time versus full time learning, for this has effect on the administration of learning.
2. The second characteristic is voluntary versus compulsory learning which refers to the self-directed and problem-centered nature of adult learning.

Considering these different personal and situational characteristics, Cross defined the following principles for adult education programs (Cross, 1982): adult learning programs should capitalize on the experience of learners; adult learning programs should adapt to the aging limitations of the learners; adults should be challenged to move to increasingly advanced stages of personal development and adults should have as much choice as possible in the availability and organization of learning programs.

2.4.3 Experiential learning

The third adult leaning theory that will be discussed focusses on the personal value of that what's being learned. According to Rogers' Experiential Learning there are two types of learning, cognitive learning and experiential learning (Rogers, 1969). Cognitive learning refers to academic knowledge which in itself Rogers regards as meaningless because it is of no personal value to the learner. Experiential learning regards the needs and wishes of the learner and anticipates personal change and growth of the learner. Therefore this type of learning is significant. Rogers (1969) defined four principles concerning learning. The first one is that significant learning takes place when the subject matter is relevant to the personal interests of the learner. The second principle is that learning which is threatening to the self (new attitudes or perspectives) is more easily assimilated when external threats are at a minimum. A third principle of learning is that it proceeds faster when the threat to the self is low. The last principle is that self-initiated learning is the most lasting and pervasive.

Rogers also stresses student-centered learning (Martin & Briggs, 1986). In this view, education is to help learners grow and develop into self-actualized individuals. Growth is possible when learners are allowed to select their own goals and are responsible for the accomplishment of them. The teacher does not instruct, but arranges the conditions for learning to occur. The most important factors of student-centered learning are: provision for self-initiation, self-direction and self-evaluation; unconditional positive regard for and trust of the learner; a facilitating climate.

2.4.4 Conclusion

From this exploration it can be concluded that adult learning supports the elements of the ARCS Model of Motivational Design in many ways. All adult learning theories that have been discussed are relevant to this research because their guidelines and principles connect to the ARCS Model of Motivational Design and they are applicable to online learning. It seems that adult learning relates to the ARCS-element Relevance the most because in order to learn, the content needs to be relevant to the adult.

2.5 Exploration of online learning

In the previous paragraphs, the concept motivation has been explored from different viewpoints in theory. Because this master's thesis focusses on motivational elements in online courses, it is important to obtain a clear understanding of online learning. What is online learning and what is the difference between online learning and traditional classroom learning? This will be discussed in the current paragraph.

2.5.1 Definition of online learning

Before considering the differences between online learning and traditional learning, it is important to find out what online learning exactly is. Kaplan-Leiserson (2005) defines online learning as learning delivered by web-based or internet-based technologies. Examples of that kind of technologies are email, bulletin boards, chat and discussion groups. Online learning can be categorized as a specific type of distance learning, which in its turn is an educational situation in which the instructor and learners are separated by time, location, or both. Means of instruction in distance learning include written correspondence, text, graphics, audio- and videotape, cd-rom, online learning, audio- and videoconferencing, interactive television and fax. Simonson, Smaldino, Albright & Zvacek (2003) formulated another definition of distance learning which is similar to the definition used above. According to Smaldino, Albright & Zvacek, distance learning is institution-based, formal education where the learning group is separated, and where interactive telecommunications systems are used to connect learners, resources and instructors.

2.5.2 Online learning versus traditional learning

Now that online learning has been discussed, difference between traditional learning and online learning will be investigated. What does traditional learning imply? Traditional learning (Relan & Gilliani, 1997) refers to the teacher centered curriculum which has the following characteristics:

- Teacher talk exceeds student talk
- Instruction occurs frequently with the whole class and small group or individual instruction occurs less often
- The use of class time is largely determined by the teacher
- Teachers look upon the textbook to guide curricular and instructional decision-making
- Classroom furniture is arranged in rows of desks or chairs facing a chalk board

Table one shows the differences between online learning and traditional learning on the basis of eleven variables: location, time, travel, participation opportunity, shared workspace, facilitation of collaborative learning, learner control, content, feedback, role of the teacher and ways of communication (Relan & Gillani (1997) & Hiltz (1993)).

Table 1

Differences between online learning and traditional learning

Characteristics of online learning	Characteristics of traditional learning
Flexible location: Learners are not bound to a geographical location	Fixed location: Physical presence of learners and teacher in a classroom is a requirement for learning to occur
Flexible time: Learners can participate any time they want	Fixed time: There is a set time and duration for the learners to participate
No or less travel: Travelling is no longer necessary (condition: the learner needs a computer and internet-connection within reach)	Travel: Travelling is necessary for the learner
Participation opportunity: Every learner has the opportunity to ask questions and make comments	Limited participation opportunity: Only one learner can speak at a time
Shared workspace: It is easy to exchange and share information	Limited shared workspace: It is not very easy to exchange and share information
Facilitation of collaborative learning: Learners can work together synchronous and asynchronous	Limited facilitation of collaborative learning: Learners can only work together synchronous
Learner control: There is facilitation of self-pacing, individualization and learner choice (for instance choice of content, time, resources, objectives, media)	Limited learner control: All learners move at the same speed, there is less individualization and learner choice
Dynamic content: The content is dynamic, up to date and can be represented in multiple ways (text, graphics, video, audio, simulation)	Static content: The content is static, not necessarily up to date and is represented in a limited kind of ways
Flexible feedback: Feedback is not restricted to the instructor and is not limited to fixed moments	Fixed feedback: Feedback is restricted to the instructor and limited to fixed moments
Facilitating role of teacher: The instructor acts as a coach or guide	Traditional role of the teacher: The instructor assumes his traditional role
Multiple ways of communication: Learners and teacher can communicate in a variety of ways (privately, collectively, synchronous or a-synchronous)	Limited ways of communication: Learners and teacher communicate in a limited kind of ways

2.6 Conclusion

The main question of this master's thesis is, what is the predictive value of the instrument which is designed to measure the motivating effect of online course material? In this chapter, the two most relevant concepts from the research question, motivation and online learning, have been explored. Several theories proved relevant for this research in a first step to designing an instrument. Figure two gives an overview of the theories from the literature exploration and their role in the research process. Together, these theories make up a conceptual framework. From this framework, items for the instrument can be defined, which will be discussed in the next chapter.

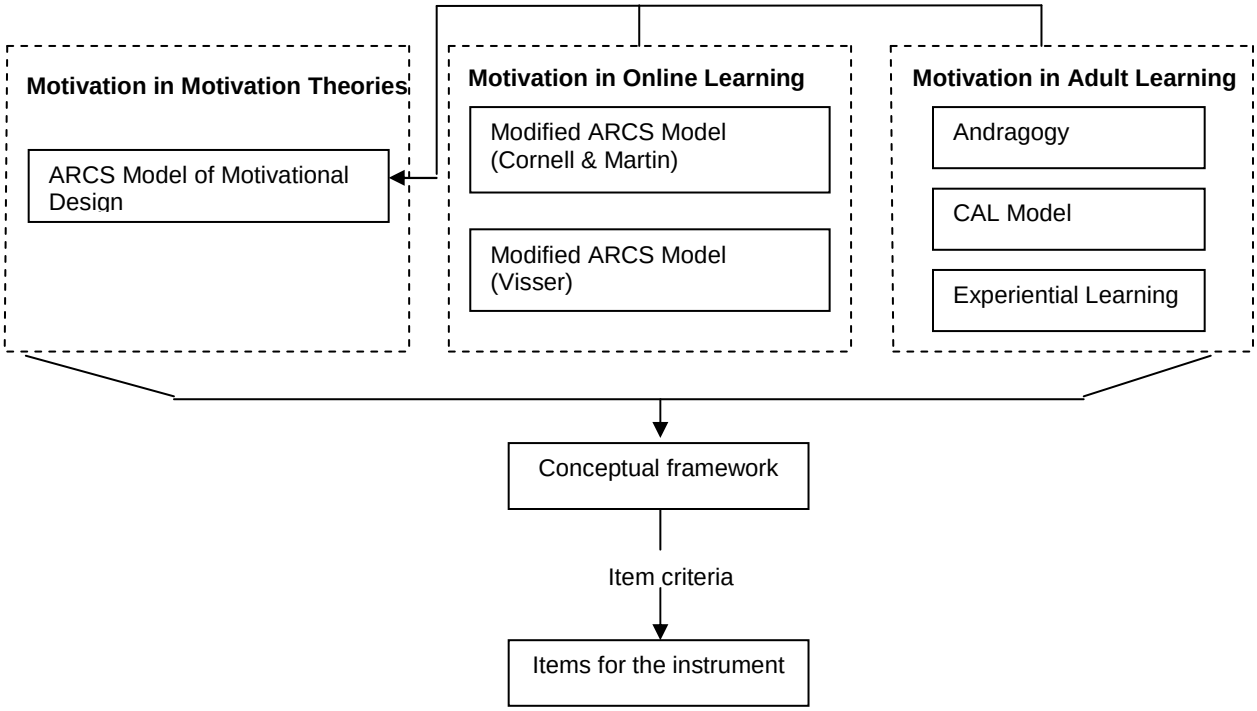

Figure 2. Overview of theories and their connections

What does the figure indicate? The figure shows an overview of theories that constitute the basis of the conceptual framework. Second, the figure shows the connection between the different theories. The lines indicate that there is a connection between the online learning theories, the adult learning theories and the ARCS Model of Motivational Design. This connection implies that the concerning theories fit within one or more elements of the ARCS Model of Motivational Design. The theories about motivation in online learning, fit within all elements of the ARCS Model of Motivational Design and the theories about motivation in adult learning fit mainly within the Relevance-element of the ARCS Model of Motivational Design.

Figure three shows the outlines of the conceptual framework. This framework makes up the basis for the coming research activities.

In online learning, motivation refers to the choices people make as to what experiences or goals they will approach or avoid, and the degree of effort they will exert in that respect (Keller, 1983). The direction and magnitude of the motivation of the online learner is related to four motivational components:

Attention: interest and curiosity of the online learner needs to be engaged and maintained. Online learning is individual and there is no face-to-face interaction between the learner and other learners or the instructor. The initial interest and attention of the learner can fade away quickly. Main requirements of the online course material:

- The online course material captures the interest of the learner
- The online course material stimulates the curiosity of the learner
- The online course material maintains the attention of the learner

Relevance: online course content and objectives need to be related to learner interests and needs. Each learner has a different background and interests. The online course material needs to provide choice to the learners in order to meet their needs: choice in goals, tasks, reading materials, etc. The course material and exercises have to be relevant for the learner: it should help them perform better at their jobs or in their personal lives. As adults, learners are self-directed and are motivated to learn as they have needs and interests that learning will satisfy. Main requirements of the online course material:

- The online course material meets the needs of the learner
- The online course material provides the learner with appropriate choices, responsibilities and influences
- The online course material matches the instruction to the learner's experiences

Confidence: confidence of the online learner needs to be enhanced. Some learners have no experience with online learning and they can feel insecure about this. The course needs to be structured and clear and learners need to know what is expected of them. This way learners can develop their confidence. Main requirements of the online course material:

- The course material helps to build a positive expectation for success
- The course material supports or enhances the learner's beliefs in their competence
- The course material helps to convince learners that their success is based on their efforts and abilities

Satisfaction: satisfaction of the learner with the online course needs to be enhanced. The online instructor cannot encourage learners face-to-face and it is important to encourage them regularly through feedback and enjoyable, fulfilling tasks. Main requirements of the course material:

- The course material provides meaningful opportunities for learners to use their newly acquired knowledge or skill
- The course material provides reinforcement to the leaner's successes
- The course material assists in anchoring a positive feeling about the learner's accomplishments

Figure 3. Conceptual framework

3. Development of an instrument to measure the motivating effect of online course material

The previous chapter resulted in an overview of relevant theories and the conceptual framework. What are the following steps? In this chapter, the development of the instrument will be discussed. Paragraph 3.1 describes the justification of the choice for an instrument, 3.2 focusses on the design of the instrument and paragraph 3.3 describes construction of the instrument. The reflection on the research process is discussed in paragraph 3.4. Paragraph 3.5 finalizes this chapter with a conclusion.

3.1 Justification

Prior to the design of the instrument, it is important to consider what kind of instrument would be suitable to measure the motivating effect of online courses. As far as the type is concerned, the instrument could be an interview, observation or rating scale. The existing Instructional Materials Motivation Survey (IMMS) developed by Keller (1990), part of the ARCS Model of Motivational Design and directed at traditional classroom learning was constructed as a rating scale for students or teachers. It would be a logical decision to design this instrument as a rating scale for students or teachers also. Both observation and interviewing takes up too much time, considering the timeframe of this research. Besides, there was no access to respondents. Next to this, a rating scale attached to a 5 point Likert-scale results in more specific and comparable data. With the IMMS in mind, a rating scale was designed which included several tactics to enhance motivation. Just like the ARCS Model of Motivational Design, the rating scale was divided into four parts. Each part consisted of tactics to enhance Attention, Relevance, Confidence and Satisfaction.

As was mentioned earlier, the most direct way to measure the motivating effect of online course material would be to administer the rating scale to online learners. Because this research was originally embedded in the Utah State University project, online learners as well as online instructors were not available. This contextual factor somewhat limited the possibilities for designing the rating scale. With this in mind, it was decided that an independent rater would evaluate the instrument, using the seven American online courses from the Utah State University project.

3.2 Design of the instrument

Considering the context and time frame, the type of instrument that was designed has been justified in the previous paragraph. In this paragraph, the design process will be discussed. What is a typical design process for constructing attitude rating scales? Henerson, Morris & Fitz-Gibbon (1987) mention eight steps for constructing a rating scale:

1. Accumulate a large number of statements (approximately 60) about the attitude you wish to measure, a good source might be prospective respondents
2. Ask a pilot group (50 or more) to respond to the statements
3. Score responses by assigning them from one to five points (1 = not true, 5 = very true)
4. Compute a score for each respondent by totaling the points corresponding to her responses

5. Identify high scores (top 25%) and low scores (lowest 25%)
6. Perform an item analysis to select from a pool of items the ones that most effectively obtain the information you want, and to eliminate the less effective items from your instrument
7. Retain those items (approximately 20) which provided good discrimination between high and low scores
8. Construct the rating scale by listing the retained statements in random order

As was mentioned in the previous paragraph, the absence of online learners due to the context of the research resulted in an adjusted design process. The design process just consisted of step one. With regard to step one, the statements about the construct were accumulated from the conceptual framework using item criteria. Next, the items were (re)formulated into measurable items. Although one of the American courses served as a pilot to test the rating scale, this is a different activity than the second step from Henerson, Morris & Fitz-Gibbon (1987): ask a pilot group to respond to the statements.

3.2.1 Item criteria

What were the criteria for selecting items from the conceptual framework for the instrument? The first criterion was that the item (or a reformulation of the item) needed to be measurable using online course material as a source. For example, an item about teacher feedback by e-mail is not measurable looking at the course material only, because the e-mail is not part of the course material. The second criterion was that the item needed to be focussed on adults and the self-directed way they learn. Items that stress teacher-centered learning or are about children are not appropriate. The third criterion was that the item needed to be relevant for online learning. An item about a group assignment in class is not useful.

3.2.2 Formulation of items

For each element from the conceptual framework (Attention, Relevance, Confidence and Satisfaction), the items are described that were taken from or based on that specific element. From the ARCS Model of Motivational Design, the majority of the items have been copied or adjusted. Adjustments were made mainly to reformulate items into measurable constructs and to adjust items to fit the context of online learning. From the adult learning theories, the majority of the items have been constructed or the theories support already existing items that were taken from the ARCS Model of Motivational Design. The concept version of the instrument consisted of 57 items and can be found in appendix one.

The majority of items were formulated on the basis of the ARCS Model of Motivational Design.

The first element is Attention. There are several strategies to increase curiosity developed by Keller (1983), Keller & Kopp (1987), Keller & Burkman (1993) and Keller & Suzuki (1988), Keller (1990): use novel, surprising, incongruous or uncertain events in instruction; use anecdotes and other devices; use analogies to make the strange familiar and the familiar strange; guide learners into a process of information-seeking behaviour by posing, or having the learner generate, questions or a problem to solve; guide learners into a process of question generation and inquiry; vary the elements of instruction; make changes in the organization and presentation of content; develop a diversity of web-based products which appeal to different learning styles; use eye-catching instruction materials; use active voice and action verbs; use sentences that are of moderate length; avoid dysfunctional attention-getting effects; vary information presentation

screens with interactive screens, consistent patterns of screen lay-out that varies from time to time; require learners to post course related questions for others to see and respond to; encourage learners to post interesting articles and resources; use text, sound and video to deliver content. This part results in the following items: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13, 14 and 15. These items are mainly located in the attention-part of the instrument.

The second element is Relevance. There are several strategies to increase relevance developed by Keller (1983), Keller & Kopp (1987), Keller & Burkman (1993) and Keller & Suzuki (1988), Keller (1990): provide opportunities to achieve standards of excellence under conditions of moderate risk; provide opportunities for choice, responsibility and interpersonal influence; enable trust and provide opportunities for no-risk, cooperative interaction; use concrete language and use examples and concepts that relate to the learner's experience and values; provide statements or examples that present the objectives and utility of the instruction; present goals for accomplishment or have the learner define them; use teaching strategies that match the profiles of the learners; build a strong relationship between what is being learned and the objectives of the course; show how the instruction relates to what the learner already knows; adapt course requirements to the learning style of the learners; use concrete language; use personal pronouns and the learner's name to make the lesson friendly and familiar; let learners choose among goal options; include options that allow learners to work together; have learners post biographies for others to read and respond to; provide learners opportunities to select how to complete an assignment; explain to learners or have them explain why they need to know this material. This part results in the following items: 16, 17, 18, 19, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33 and 34. These items are mainly located in the relevance-part of the instrument.

The third element is Confidence. There are several strategies to increase expectancy for success developed by Keller (1983), Keller & Kopp (1987), Keller & Burkman (1993) and Keller & Suzuki (1988), Keller (1990): use instructional design strategies that indicate the requirements for success; offer opportunities for personal control; use attributional feedback which helps learners to connect success to personal effort and ability; make learners aware of performance requirements and evaluative criteria; provide multiple achievement levels; provide personal opportunities for the learner to experience success; include a study guide; provide opportunities for learners to interact with the instructor, other learners and the instructional materials; provide short segments of instruction; provide frequent summaries and reviews; provide frequent conformational and corrective feedback; make the initial perception of print courseware seem easy, rather than difficult; make the instructional text well organized; use graphics, pictures, maps and charts; mention the skills, knowledge or attitudes that will help the learner succeed at a task; content and practice exercises are arranged from easy to difficult; vary difficulty level; allow the learner to escape and return to the menu at any time, and if feastable, to page backwards; support the sharing of study tips and tricks; encourage learners to provide casual feedback to other learners; clearly state how assignments are marked. This part results in the following items: 38, 39, 40, 41, 42, 43, 44, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 65 en 69. These items are mainly located in the confidence-part of the instrument.

The fourth element is Satisfaction. There are several strategies to enhance satisfaction with the instruction developed by Keller (1983), Keller & Kopp (1987), Keller & Burkman (1993) and Keller & Suzuki (1988), Keller (1990), Small (1995): use task-endogenous rewards (rewards that customarily or naturally follow from a task); use verbal praise and informative feedback rather than threats, surveillance or external performance evaluation; use motivating feedback following the response; provide corrective feedback when it will be immediately useful; provide opportunities to use the newly acquired knowledge or skill in a real or simulated setting;

maintain consistent standards and consequences for task accomplishment; provide the opportunity for learners to use the new skills and knowledge learned during the course; reward accomplishment by using positive feedback; encourage collaboration between learners as they develop web-based assignments; use compliments; describe what the learner can expect to achieve; create mentor relationships amongst different levels of learners; encourage learners to share subject related experiences; bring attention to the intrinsic enjoyment that learners feel as a result of reducing the uncertainty connected with curiosity; provide the learner with additional materials about related areas of interest. This part results in the following items: 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 70 en 72. These items are mainly located in the satisfaction-part of the instrument.

A number of items were formulated on the basis of the modified ARCS Model of Motivational Design.

The first element is Attention. The considerations of Cornell & Martin (1997) result in the following items: 1, 2, 3, 4, 5, 6 and 15. These items are located in the attention-part of the instrument. Visser (1998) proposes the following strategies: do not send all the material at once to the learner but send it in parts after the learner finished a certain part, use various media, send motivating messages occasionally, give feedback quickly, give challenging statements and show real interest. This part results in the following item: 1 and 15. These items are located in the attention-part of the instrument.

The second element is Relevance. The considerations of Cornell & Martin (1997) result in the following items: 19, 20, 21, 24, 28, 29, 30 and 33. These items are located in the relevance-part of the instrument. Visser (1998) proposes the following strategies: inquire if the learner thinks the course has contributed to better performance after the first assignment, give examples (especially in feedback) that relate to the learner's daily circumstances and explain in detail why the learner has to do certain things. This part results in the following items: 4, 20, 21 and 25. These items are mainly located in the relevance-part of the instrument.

The third element is Confidence. The considerations of Cornell & Martin (1997) result in the following items: 42, 43, 45 and 55. These items are located in the confidence-part of the instrument. Visser (1998) proposes the following strategies: encourage learners to send in their first assignment early, introduce feedback loops that allow learners to catch up or to improve, provide opportunities for students to be successful and stress that if learners work hard, they will succeed. This part results in the following items: 39, 49, 53, 54 and 67. These items are mainly located in the confidence-part of the instrument.

The fourth element is Satisfaction. The considerations of Cornell & Martin (1997) result in the following items: 70 and 71. These items are located in the satisfaction-part of the instrument. Visser (1998) proposes the following strategies: give frequent, timely and adequate feedback, let learners know how far they have come already and include personal satisfaction remarks. This part results in the following items: 62, 63, 64 and 71. These items are located in the satisfaction-part of the instrument.

A small number of items were formulated on the basis of the adult learning theories.

The five principles of adult learning, formulated by Knowles (1978, 1980) result in the following items: 7, 8, 12, 19, 20, 21, 29, 30, 33, 35, 37, 38 and 71. These items are located in the attention-, relevance- and satisfaction-part of the instrument. The characteristics needed in

distance education systems designed for adults (Simonson, Smaldino, Albright & Zvacek, 2003) result in the following items: 34, 36, 57 and 69. These items are located in the confidence- and satisfaction-part of the instrument.

The remarks of Moore & Kearsley (1996) regarding the differences between the needs of children and the needs of adults in learning, result in the following items: 19, 24, 30 and 35. These items are located in the attention and relevance-part of the instrument.

The principles for adult learning education programs defined by Cross (1982) result in the following items: 11, 12, 13, 15, 19, 20, 21, 24, 28, 29, 30, 33, 34, 35, 38, 55, 57 and 58. These items are located in each of the elements of the ARCS Model of Motivational Design.

The four principles for experiential learning that were defined by Rogers (1969) result in the following items: 19, 20, 21, 26, 28, 29, 30, 43 and 53. These items are located in the relevance and confidence-part of the instrument.

3.3 Construction of the instrument

The final version of the instrument consists of 54 items and can be found in appendix two. Each of the items is accompanied by helpful hints (instructions for the rater) which define or clarify concepts used in a specific item for the rater. The rater is an independent party who uses the instrument to evaluate online courses and is not a user or online learner. Next to this, the answering possibilities have been defined in detail. By doing this, the item becomes less subjective and more measurable and unambiguous. An example shown in figure four.

42. The course provides feedback that supports the learner's ability and support	Look for feedback that attributes accomplishment to the learner's ability and effort in threaded discussions, message boards, etc. Feedback should contain these elements: focus on behaviour, be specific, focus on new aspects, be clear and emphasize the positive 1 = the course does not provide feedback 2 = the course provides poor feedback that contains few elements 3 = the course provides reasonable feedback that uses some elements 4 = the course provides fair feedback that uses most elements 5 = the course provides good feedback that uses all elements	1 = not true 2 = slightly true 3 = moderately true 4 = mostly true 5 = very true NA = not applicable

Figure 4. Example item from instrument

The first column contains the item number and statement. The second column contains a helpful hint directed at the rater which tells the rater where to look in the course material and gives a definition of feedback. This column also contains a definition of the answering options. The third column contains the five-point Likert scale. NA means not applicable. This means that an item cannot be rated because the rater has no access to the specific material (for example, some threaded discussions are erased because of privacy reasons) or the intention of the course does not correspond with the item (for example, in some courses there are no possibilities for learner interaction because this was never the intention of the course, so questions about this topic are irrelevant). As was indicated, each of the four ARCS elements is represented by a number of

motivation tactics. Attention contains 14 tactics, Relevance contains 16 tactics, Confidence contains 14 tactics and Satisfaction contains 10 tactics.

3.4 Reflection and additional research question

In the introductory chapter, the chronological research process has been described, and the reflectional step that led to the additional research activity has been mentioned briefly. Phase one, the design of the instrument has been rounded off at this moment. This paragraph discusses the reflection in more detail and describes the newly formulated research question as a result of the reflection. After this reflection, this master's thesis will focus on phase two, determining the quality of the instrument.

After finishing the first phase of the research, some considerations linger. Those considerations are largely related to the context in which the first phase of the research was conducted. That context limited the choices for design of the instrument. Due to the availability of online course material only, a very important viewpoint has been ignored: the viewpoint of the online learner. In order to be able to say something about the motivating effect of online course material, the learner is a direct and very logical source of information. Especially with the subjective nature of the concept motivation, qualitative data would be a valuable addition.

Next to this, another consideration is important. Now that the instrument has been constructed using an adapted design process, it is still unclear what the quality of this instrument is. Does the instrument really measure what it pretends to measure? And: does the instrument yield the same results when administered multiple times? In order for the instrument to be usable in any way, research activities need to be employed in order to pass judgment about the quality of the instrument.

This reflection results in the new research question: <u>what is the predictive value of the instrument which is designed to measure the motivating effect of online course material?</u>

3.5 Conclusion

With the conceptual framework as a basis, items for the instrument have been formulated. The four elements of the ARCS Model of Motivational Design constitute the framework of the instrument. The final instrument consists of 54 items which have been defined as objective as possible. Each item consists of a motivation tactic, to a certain degree included in the course material.

The reflection described the need for additional research material from the viewpoint of the online learner. Hence, the newly formulated research question leads to the next chapter, which will discuss the research activities that have been employed in order to determine the quality of the instrument.

4. Research approach: determining the quality of the instrument

Now that the instrument has been designed, this chapter focusses on determining the quality of the instrument. In this chapter, four research activities will be discussed that have been undertaken in order to construct a qualitative instrument. The concept of quality will be briefly explored in paragraph 4.1. Paragraph 4.2 describes the first research activity, an evaluation with American online courses. Paragraph 4.3 discusses the determination of the inter-rater reliability. The third research activity, an expert-evaluation, will be described in paragraph 4.4. An evaluation with online learners will be described in paragraph 4.5. Paragraph 4.6 concludes this chapter.

4.1 Exploration of the concept quality

Quality is a subjective concept and therefore hard to define and measure. To determine the quality of the instrument, that quality has to be measurable. In the dictionary, quality is defined as a degree or grade of excellence or worth. In a broad perspective, the quality of a specific product is defined as the degree to which products achieve or exceed production standards (Desimone, Werner & Harris, 2002). With regard to the designed instrument, what are ways to measure instrument quality? Assessments of validity and reliability help to determine the amount of faith people should place in the measurement instrument (Henerson, Morris & Fitz-Gibbon, 1987). What does validity mean? A valid instrument measures what it is designed to measure. Reliability refers to the consistency and stability of the instrument. A reliable instrument is one that is consistent enough to provide approximately the same results in subsequent measurements of an item (Philips, 1997). By determining the validity and reliability of the instrument, the quality becomes visible.

4.2 Evaluation with American online courses

After the construction of the concept instrument, the instrument has been evaluated by using it on American online courses. Seven online courses were used for this purpose. On the basis of this evaluation, several changes and adjustments have been made on the concept instrument. From the evaluation it turned out that some items were not measurable after all. It also turned out that some items needed to be constructed in a more objective way. Concepts used in items needed to be defined more clearly, or examples needed to be given.

An example of an item that proved hard to measure is item one of the concept instrument:

1. The course provides novel, surprising or unusual events.	1 2 3 4 5 na

Figure 5. Example item that was hard to measure

It was not possible to define the concepts novel, surprising and unusual in order for them to be interpretable in one way. As a consequence, this item was removed from the instrument.
An example of an item which needed an example for clarification is item five of the concept instrument:

5. Course content is written in an active style.	1 2 3 4 5 na

Figure 6. Example item that needed extra clarification

To make certain that there was no doubt about the meaning of active style, an example was added.

5. Course content is written in an active style.	Look for actively used verbs, for example: Active style = the experiment examines the relationship between two theories. Passive style = the experiment is conducted so that the relationship between the two theories can be examined.	1 2 3 4 5 na

Figure 7. Example item where an example has been added

An example of an item where the answering possibilities were defined in a more measurable way is item four of the concept instrument:

4. Course content contains anecdotes and examples.	1 2 3 4 5 na

Figure 8. Example item where the answers have been defined more measurable

A translation of 1 (not true), 2 (slightly true), 3 (moderately true), 4 (mostly true) and 5 (very true) has been added:

4. Course content contains anecdotes and examples.	1 = course content does not contain any anecdotes and examples 2 = few course content (25%) contains anecdotes and examples 3 = some course content (50%) contains anecdotes and examples 4 = most course content (75%) contains anecdotes and examples 5 = all course content contains (100%) anecdotes and examples	1 2 3 4 5 na

Figure 9. Example item where the answers have been defined more measurable

The results of this evaluation will be described in paragraph 5.1.

4.3 Determining inter-rater reliability

Another activity to improve instrument quality is to determine the inter-rater reliability. What is inter-rater reliability exactly? It is a way to demonstrate that the evaluation that is performed has been minimally contaminated by inconsistency among human instruments (Huizingh, 1997). This can be achieved by having more than one person perform at least a sample of the ratings of the instrument. If different people rate the instrument in essentially the same way, then there is evidence that the criteria for scoring have been well learned and uniformly applied by the raters (Henerson, Morris & Fitz-Gibbon, 1987). In this master's thesis, the inter-rater reliability has been determined with Sommers'd and with Kendall's Tau-b. The advantage of these measures is that they take chance into account (this in contrast to percentage agreement) and they consider the closeness of the scores of the raters (in contrast to Cohen's Kappa). Results can be interpreted according to these values: below 0.00 = poor agreement, 0.00-0.20 = slight agreement, 0.21-0.40 = fair agreement, 0.41-0.60 = moderate agreement, 0.61-0.80 = substantial agreement and 0.81-1.00 = almost perfect agreement.

To prove that the evaluation in this master's thesis has indeed been minimally contaminated by inconsistency among human instruments, each course was evaluated by two trained raters and inter-rater reliability was measured. The final instrument was used in this activity. Because of the large amount of time it took to evaluate the courses, one additional rater was attracted. The researcher (master student Human Resource Development) acted as the first rater and an Instructional Technology PhD-student acted as second rater. This rater is an expert in the field of online instruction. This means the rater is familiar with specialist terms and has experience with evaluating online courses.

The second rater received preliminary rater training during a pilot test during which the two raters evaluated one course separately, without any clarification of the items. After finishing, the raters sat together and discussed the items on which their opinion differed substantially (two or more points on the five-point scale). The goal was to come to a mutual agreement on these items, either by discussing and eventually agreeing on the way an item needs to be interpreted, or by changing the definition of the item. The results of this determination will be described in paragraph 5.2.

4.4 Expert evaluation

Validity (Henerson, Morris & Fitz-Gibbon, 1987) refers to the question: is this instrument an appropriate one for what needs to be measured? One way to check validity is by performing an expert evaluation where the instrument is sent to an expert to obtain suggestions for modification (Cronbach, 1971). This kind of validity is referred to as face validity.

The instrument was sent to dr. J.M. Keller, founder of the ARCS Model of Motivational Design. In order to make the expert evaluation more useful, dr. Keller was asked three specific questions concerning the construct validity (question 2) and content validity (question 1 and 3):

1. Do the items of the instrument fit properly in each of the categories of the ARCS-frame?
2. Are the items of the instrument all motivating elements?
3. Is the instrument complete, are there important motivation elements missing?

The results of the expert evaluation will be described in paragraph 5.3.

4.5 Evaluation with online learner

4.5.1 Research activities

The previous paragraphs described methods to improve the quality of the instrument. To improve validity further, it is useful to investigate whether there are other ways to measure motivation in order to compare these measures with the measures of the motivation instrument. One other way to measure motivation is to ask users of online instruction about their motivation during their enrollment in a course or training. Another way is to compare the results from the instrument with the results of other instruments, administered at approximately the same time, which also measure motivation. This is called concurrent validity (Henerson, Morris & Fitz-Gibbon, 1987). A third, more indirect way was to look at the success rate of online courses. This gives some indication of the motivation of the learners. Figures about drop-out rates were not available. Also, no comparable instrument was found in literature. The need for qualitative data from the online learner led to the decision to interview online learners.

Online learners provide direct information about the motivating effect of the course material. Because access to online learners was not possible before, this new research activity used four new Dutch online courses. The data gathered from the online learners can be compared with the results from the instrument to give an indication of its validity. Because the subject motivation is subjective and very personal by nature, the most ideal way to gather information is to interview online learners face-to-face. This way, a trusting atmosphere could be created and the interviewer has the ability to ask for clarifications. In order to be able to compare the results of the different interviews, the interview procedure needs to be standardized as much as possible. This means that the interview introduction, the interview questions, the recording and analyzing of the data needs to be identical for every case. As far as the number of respondents concern, three courses with each four respondents seemed an appropriate amount for the evaluation, given the time constraints of this thesis.

What way has this evaluation been conducted and what research activities have been employed?

1. Selecting usable online courses from higher education institutions and professional organizations. One important criterion for selection was that the course did not contain any blended elements. Another important criterion for selection was as many items from the instrument as possible need to be applicable to the online course. This way, all aspects of the instrument could be evaluated. For example, to be able to evaluate items about the role of the instructor it is important that the online course has an instructor.
2. The selection of the respondents. It is preferred to select respondents random. Respondents who volunteer to be respondents might have a more overall positive attitude regarding the online course.
3. The development of the interview materials. The interview guide and interview questions have been designed.
4. Conducting the interviews. One interview was used as a pilot, to determine whether the interview questions were clear and understandable and for the interviewer to practice her interview skills. For this purpose, the respondent was asked to evaluate the interview questions, interview guide and skills of the interviewer.

5. Choosing a way to record the data. There are several ways to record data. The most reliable way is to record the interview with a recording device. That way, no information is lost, the interview can be worked out in detail and where needed parts of the interview can be re-listened.
6. Deciding how to analyze the data. First, typifications have been made of the nine respondents in order to give an idea about who the respondents are and how they judge different motivating elements. The most appropriate way to analyze qualitative data is to describe trends and tendencies in the data, arranged per question. First the data from the interviews and instrument is described according to tendencies that can be found and second, the data from both sources will be compared. Ultimately, conclusions can be drawn.

4.5.2 Design of interview materials and respondent typification

As has been indicated in the previous paragraph, an interview introduction and interview questions have been developed. Next to this, a typification for the respondents has been designed. The interview introduction contained the following items (Emans, 1985): background information about the research, the goal of the interview, the reason for voice recording, type of reporting, anonymity issues, the type of information the interviewee has to expose and appreciation for the cooperation of the interviewee. The goal of this introduction was to inform and reassure the interviewee by making mutual expectations clear. The interview introduction can be found in appendix three.

What are ways to get an image of the motivation of the online learner? One way is by using the ARCS Model of Motivational Design, but there are other relevant factors. These factors are motivation barriers, intrinsic motivation, support for learning, interaction, and transfer of training.

- Barriers to motivation are relevant because they can effect the motivation of the learner in a negative way. One barrier could be that the learner is inexperienced with online learning and is somewhat reluctant to start.
- Intrinsic motivation is a specific kind of motivation. If a learner is intrinsically motivated (he/she engages in tasks for the pleasure that comes from that task (Song, 1998)), this may have an effect on his/her motivation.
- Support is also a factor that might influence motivation. If the learner is supported in his/her learning by colleagues, a superior, family or friends this may have an effect on his/her motivation. Support can be related to course content or related to providing conditions.
- Interaction is relevant because it may have an effect on motivation. Interaction with fellow learners and the teacher can be a source of motivation to the learner.
- Transfer of training regards the ability to directly apply back on the job what has been learned in the training with very little adjustment or modification (Desimone, Werner & Harris, 2002). If the learner notices that he/she can apply the things he/she learned, this may have an effect on his/her motivation to learn.

The interview itself has been divided into three parts. In table two, the parts of the interview and matching questions have been described.

Table 2

Overview of questions and constructs regarding the interview

Part	Question	Content of the questions
1	Q1-Q5	Questions about motivation barriers
2	Q6-Q12	Questions about intrinsic motivation
3	Q13-Q18	Questions about motivation in general
	Q19-Q20	Questions about ARCS element Attention
	Q21-Q24	Questions about ARCS element Relevance
	Q25-Q26	Questions about ARCS element Confidence
	Q27-Q28	Questions about ARCS element Satisfaction

Part three contains questions about the ARCS elements. These four elements are also taken up as items in the instrument. By asking online learners about the same four elements, the results of the interviews and the instrument can be compared as a check of validity. Parts one and two contain questions about barriers to motivation and intrinsic motivation. The answers to these questions may provide a declaring value concerning the degree of motivation of the online learners. To recapture, questions from part three are useful to validate the instrument and questions from part one and two serve as possible explanations for differences between online learners.

In addition, there are several questions which concern a specific construct. These constructs could be relevant to interpret the results. Q10 concerns support for learning, Q11 concerns intrinsic motivation, Q15, Q16 and Q17 concern interaction with respectively the learning material, trainer or instructor and fellow students, Q23 and Q24 concern transfer of training.

Complementary to their content, the interview questions are based on the Curricular Spider web (van den Akker, 2003). This spider web describes the components of a curriculum and is a metaphor for the curriculum and the many interconnections between its components. This spider web is used as a basis because in this way, all aspects of the curriculum are covered in the questions. Table three shows the ten components of the curriculum and the questions that are related to each of the components.

Table 3

Overview of questions and curriculum components

Question	Component	Meaning
Q6, Q9	1. Rationale	Why are the students learning?
Q12	2. Aims and objectives	Toward which goals are the students learning?
Q7, Q8, Q15	3. Content	What are the students learning?
Q11	4. Learning activities	How are the students learning?
Q16	5. Teacher role	How is the teacher facilitating learning?
Q1, Q2, Q3, Q15	6. Materials and resources	With what are the students learning?
Q17	7. Grouping	With whom are the students learning?
Q1	8. Location	Where are the students learning?
Q4, Q5, Q18	9. Time	When are the students learning?
Q14	10. Assessment	How far has the learning progressed?

An overview of the interview questions can be found in appendix four.

As has been indicated, a typification of the respondents has been made in order to give a clear overview of their characteristics and preferences. This typification was based on demographic variables and the interview questions. The interview questions have basically been narrowed down into two answering possibilities: yes and no. Because of the open character of question six (what was the reason or were reasons that you started with this course?) and question twelve (what did you want to accomplish with this course?) it was not able to narrow down the answers to yes or no. These questions have been left out of the typification.

Table four shows the definitions of the answering types.

Table 4

Definition of answering possibilities for the typification of the respondents

Indicators	Definition of types
Demographic variables	
Sex	Male / Female
Country of residence	…….
Highest finished education	…….
Indicators for barriers to motivation	
1. Fulltime access to computer and internet	Yes (fulltime access at location where course is taken) No (no fulltime access at location where course is taken)
2. Experience with online learning	Yes (experience with at least one or more online courses) No (no experience at all with online courses)
3. Experience with pc and internet	Yes (structural use of pc and internet at home/work) No (no or no structural use of pc and internet at home/work)
4. Spent time	Time in hours …….
5. Duration	Duration in hours/days/weeks …….
Indicators for intrinsic motivation	
7. Previous knowledge of subject	Yes (some or extensive knowledge about subject) No (no or negligible knowledge about subject)
8. Interest in subject	Yes (personal/professional interest in subject) No (no personal/professional interest in subject)
9. Voluntariness to start	Yes (voluntary start of course) No (mandatory start of course)
10. Support	Yes (aimed support of family/superior) No (no or not aimed support of family/superior)
11. Enjoyment	Yes (enjoyment of course and learning activities) No (no enjoyment of course and learning activities)
Indicators for motivation	
13. Motivation in general	Yes (feeling of motivation present during majority of course) No (lack of feeling of motivation during majority of course)
14. Completion	Yes (successful completion of the course according to course standards) No (unsuccessful completion of the course according to course standards)
15. Motivating effect course material	Yes (course material has motivating effect for majority of course) No (course material has no motivating effect for majority of course)

16. Motivating effect instructor/superior	Yes (instructor/superior has motivating effect for majority of course) No (instructor/superior has no motivating effect for majority of course)
17. Motivating effect fellow students/colleagues	Yes (fellow students/colleagues have motivating effect for majority of course) No (fellow students/colleagues have motivating effect for majority of course)
18. De-motivation in general	Yes (feeling of de-motivation present during majority of course) No (feeling of de-motivation absent during majority of course)
Indicators for Attention	
19. Interestingness	Yes (majority of the course is interesting) No (majority of the course is not interesting)
20. Retaining of attention	Yes (majority of the course keeps attention) No (majority of the course does not keep attention)
Indicators for Relevance	
21. Connection with personal/professional goals	Yes (connection to one or more personal/professional goals) No (no connection to personal/professional goals)
22. Connection with previous knowledge/experience	Yes (some or extensive connection) No (no or no relevant connection)
23. Expectancy of transfer of training	Yes (expectancy to apply some or most of what is learned) No (expectancy to apply non or negligible part of what is learned)
24. Real transfer of training	Yes (applies some of most of what is learned) No (applies non or negligible part of what is learned)
Indicators for Confidence	
25. Positive expectancy of success	Yes (positive expectancy of success) No (negative expectancy of success)
26. Personal influence on success	Yes (big or most influence on success) No (little or no influence on success)
Indicators for Satisfaction	
27. Satisfaction	Yes (one or more moments of satisfaction during or/and after the course) No (no moments of satisfaction during or/and after the course)
28. Recognition by fellow students and instructor/superior and colleagues	Yes (one or more moments of recognition) No (no moments of recognition)

4.6 Conclusion

The previous paragraphs described methods to improve the quality of the instrument. Within this master's thesis, four research activities have been employed to determine the quality of the instrument. Considering the research process of this master's thesis, these research activities were most feasible.

The first research activity was an evaluation with the seven American online courses. The second research activity has been determining the inter-rater reliability. The third research activity has been an evaluation by motivation expert dr. Keller. The fourth and most extensive research activity has been an evaluation with online learners of Dutch online courses. Using multiple methods, these activities will provide a clear image of the quality of the instrument. The results of the four research activities will be described in the next chapter.

5. Results: determination of the quality of the instrument

In this chapter, the results of the evaluation activities will be described. Paragraph 5.1 will go into the results of the evaluation with the online courses. This evaluation was carried out as part of the original research question, to what degree have motivational elements been integrated in ten online courses perceived as of high quality by professional organizations and higher education institutions? Because a detailed description of the results is not relevant for the current research question, one of the courses will be worked out as an example. Paragraph 5.2 and 5.3 will show the results of the inter-rater reliability and the expert evaluation. Paragraph 5.4 will go into the results of the evaluation with the online learner. The chapter will be concluded in paragraph 5.5.

5.1 Results evaluation of American online courses: one example

A total of seven courses were evaluated by using the instrument (see appendix two). Originally, ten courses were available. Three of the courses could not be defined as being online courses and were therefore excluded from the research. This evaluation resulted in 54 scores between one and five for each of the seven courses. A score of one means that the statement in the item is judged as being not true and a score of five means that the statement in the item is judged as being very true. The scores were imported in SPSS, a program for statistical analysis. The mean scores for every course were computed, as well as mean scores for each of the ARCS elements. To recapture, Attention refers to engaging and maintaining the interest and curiosity of the learner, Relevance refers to relating course content and objectives to learner interest and needs, Confidence refers to enhancing the confidence of the learner and Satisfaction refers to enhancing the satisfaction of the learner with the course. The results are described in table five.

Table 5

Mean scores of the seven online courses

	Course 1	Course 2	Course 3	Course 4	Course 5	Course 6	Course 7	Total
Attention	3.71	3.79	3.44	3.08	4.00	3.25	3.43	3.53
Relevance	2.69	4.00	2.50	2.31	3.08	2.54	3.06	2.88
Confidence	2.92	3.69	3.22	3.18	4.20	2.70	3.62	3.36
Satisfaction	3.50	2.88	3.00	2.33	2.67	2.33	3.00	2.82
Total	3.16	3.69	2.97	2.76	3.56	2.76	3.29	3.19

These results have to be interpreted with care, because of the small amount of online courses that were used. The differences between the courses are not necessarily significant. What do these results imply? As an example, the results from course two “Research for the classroom teacher” will be worked out in more detail. This college course from Utah State University has won the WebCT 2001 exemplary course award. The course focusses on making research relevant in the professional lives of the learner. Topics include library research, quantitative and qualitative analysis, design of research, needs analysis and formative evaluation. The course contains of ten units with course content and assignments. The units contain video material from the instructor as well as written module content. Students use three books which are not online.

Next to the ten lesson units there is a syllabus, online discussion environment, chat room, e-mail function, a calendar with events and deadlines and weblinks. Now that a short impression of the course is given, the results will be discussed.

- Items that enhance Attention have a mean score of 3.79. This means that the statements in these items about engaging and maintaining the interest and curiosity of the learner have been rated as being mostly true. Averagely the online course material contains a pretty large amount of elements which enhance Attention.
- Items that enhance Relevance have a mean score of 4.0. This means that the statements in these items about relating course content and objectives to learner interest and needs have been rated as being mostly true. Averagely the online course material contains a pretty large amount of elements which enhance Relevance.
- Items that enhance Confidence have a mean score of 3.69. This means that the statements in these items about enhancing the confidence of the learner have been rated as being mostly true. Averagely the online course material contains a pretty large amount of elements which enhance Confidence.
- Items that enhance Satisfaction have a mean score of 2.88. This means that the statements in these items about enhancing the satisfaction of the learner with the course have been rated as being moderately true. Averagely the online course material contains a fair amount of elements which enhance Satisfaction.
- Overall, all items that enhance motivation have a mean score of 3.69. This means that statements in these items about enhancing motivation have been rated as being mostly true. Averagely the online course material contains a pretty large amount of motivating elements.

Looking at the results, a few matters stand out. Averagely, elements that enhance Relevance have been integrated the most in the online course material. This can be explained by the fact that the course has a design that is fairly learner centered. The learner is not simply viewed as a passive recipient of instruction but as an individual with pre-existing knowledge, capacities and motivations. In stead of direct instruction, the learner needs to solve problems that have personal relevance (Reeves & Reeves, 1997). In addition, the instructor has a coaching in stead of traditional teacher role. This could have positive consequences for elements that enhance Relevance.

Next to this, elements that enhance Satisfaction have been integrated the least in the online course material. This can be explained by the fact that with online learning, it's difficult to help the learning in attaining a positive feeling about their accomplishments. This is a personal feeling, and course material might not be the best way to enhance Satisfaction. Personal interaction between instructor and learner is more suitable to enhance feelings of Satisfaction. Unfortunately, this falls outside the scope of the instrument.

From this example it becomes clear that in order to interpret the quantitive data from the instrument, qualitative data from the user perspective is of great importance. The interpretation of mean scores with only the course material is rather one-sided. The viewpoints of the online learner can be used as explanatory factors in this master's thesis. Besides presenting the results of the evaluation with the online courses, this worked out example serves to prove the need for qualitative data. The results of the evaluation with the online learner will be discussed in the next paragraph.

5.2 Results inter-rater reliability

The inter-rater reliability has been determined by measuring with Kendall's Tau-b and Sommers'd. The results are depicted in the table six.

Table 6

Inter-rater reliability of the instrument

Course	Measure	Value	Sig
1 Digital craft 1	Kendall's Tau-b	0.66	0.00
2 Pilot: Research for the classroom teacher	Kendall's Tau-b	0.75	0.00
3 Understanding visual and performing arts	Kendall's Tau-b	0.62	0.00
4 Excel 2003 fundamentals	Kendall's Tau-b	0.62	0.00
5 Online SAT course	Kendall's Tau-b	0.68	0.00
6 Landscaping design	Kendall's Tau-b	0.75	0.00
7 Psychology of communication	Kendall's Tau-b	0.64	0.00
Total	Kendall's Tau-b	0.67	0.00

The results from both measures are identical, therefore only Kendall's Tau-b is shown in the table. The results from this pilot study show, that inter-rater reliability is substantial. This value resulted in the evaluation of the other courses. The results show that the inter-rater reliability per course is substantial because it is between the values 0.61 and 0.80. The inter-rater reliability for all of the courses is 0.674.

5.3 Results expert evaluation

Although dr. Keller did not specifically answer the three questions, he provided useful comments about the usability of the instrument. The main point that the expert made was that he did not consider the instrument to be a measurement instrument. The instrument consists of several tactics for each of the four categories of the ARCS Model of Motivational Design. He indicated that although the tactics represent each of the categories, using all of the tactics will not necessary result in a more motivating product than just using some of the tactics. So, according to the expert, a high score on the instrument (which means a lot of items from the instrument are present in the course material) does not always mean that the course will be more motivating than a course which receives a low score. Using all of the tactics might work annoying in stead of motivating, dependant of the goals of the course and the attitudes of the learners and their expectations.

5.4 Results evaluation online learners

This chapter will give a description of the results of the evaluation with the online learner. To obtain qualitative data from the learner's perspective, nine online learners have been interviewed and four Dutch courses were evaluated with the instrument. First, the results from the interviews will be discussed in 5.4.1. Second, the results of the instrument will be discussed in 5.4.2. Third, the results of the interviews and of the instrument will be compared in order to validate the instrument in 5.4.3.

5.4.1 Results interviews

Nine online learners served as respondents and were interviewed and asked about their motivation regarding four Dutch online courses. One respondent was interviewed with regard to course one, 'Oracle iLearning: getting started with Oracle iLearning'. This interview served as a pilot. Three respondents were interviewed with regard to course two, 'Operations deel 1'. Four respondents were interviewed with regard to course three, 'Textual criticism and textual history of the Old Testament'. One respondent was interviewed with regard to course four, 'Derivaten'. For course one and four, no additional learners were available to serve as respondents.

Relevant to mention for the results is that course three is the only course where the learners interact with an instructor and with other learners. In courses one, two and four the learner goes through the learning material and assignments alone.

All interviews, except the interviews for course three, were held face-to-face. The respondents of course three were interviewed over the telephone, because they lived in America, England and Canada. Due to technical difficulties, one of the respondents submitted the answers to the interview questions through e-mail. The interviews were recorded with an mp3 player after permission of the respondents.

To obtain a quick overview of the interviewees and their answers, table seven shows a typification of the nine respondents. This typification is based on table four in paragraph 4.5.2. Respondent one corresponds with course one. Respondents two, three and four correspond with course two, respondents five, six, seven and eight respond with course three and respondent nine corresponds to course four.

Table 7

Typification of the respondents

Typification of respondents	Resp. 1	Resp. 2	Resp. 3	Resp. 4	Resp. 5	Resp. 6	Resp. 7	Resp. 8	Resp. 9
Course	1	2	2	2	3	3	3	3	4
Demographic variables									
1. Sex	Female	Male	Female	Male	Female	Male	Male	Female	Male
2. Country of residence	Nether-lands	Nether-lands	Nether-lands	Nether-lands	America	Canada	England	America	Nether-lands
3. Highest finished education	University	Secondary education	Higher vocational education	Secondary education	University	University	University	University	University
Indicators barriers motivation									
1. Fulltime access to computer and internet	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2. Experience with online learning	Yes	Yes	Yes	No	Yes	No	No	No	No
3. Experience with pc and internet	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4. Spent time	45 minutes	20 hours	20 hours	20 hours	180 hours	60 hours	60 hours	15 hours	4.5 hours
5. Duration	1 day	2 weeks	3 days	2 days	12 weeks	12 weeks	12 weeks	Unknown	3 days
Indicators intrinsic motivation									
7. Previous knowledge of subject	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes
8. Interest in subject	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
9. Voluntariness to start	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes
10. Support	No	No	No	No	Yes	Yes	No	Yes	No
11. Enjoyment	No	No	No	No	Yes	Yes	Yes	No	No
Indicators for motivation									
13. Motivation in general	Yes	No	Yes	Yes	No	Yes	Yes	No	No
14. Completion	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No
15. Motivating effect course material	Yes	No	No	Yes	No	Yes	Yes	No	No

16. Motivating effect instructor/superior	No	No	No	No	No	Yes	Yes	Yes	No
17. Motivating effect fellow students/colleagues	No	No	No	No	No	No	Yes	No	No
18. De-motivation in general	No	Yes	No	No	Yes	No	No	Yes	Yes
Indicators for Attention									
19. Interestingness	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
20. Retaining of attention	No	No	No	Yes	Yes	Yes	Yes	No	Yes
Indicators for Relevance									
21. Connection with personal/professional goals	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes
22. Connection with previous knowledge/experience	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
23. Expectancy of transfer of training	Yes	Yes	No	No	Yes	Yes	Yes	Yes	No
24. Real transfer of training	No	Yes	No	No	Yes	Yes	Yes	Yes	No
Indicators for Confidence									
25. Positive expectancy success	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
26. Personal influence on success	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Indicators for Satisfaction									
27. Satisfaction	No	No	No	No	Yes	Yes	Yes	Yes	No
28. Recognition by fellow students and instructor/superior and colleagues	No	No	No	No	Yes	No	Yes	No	No

The results of the interviews will be described according to the indicators that have been defined: possible barriers for motivation, intrinsic motivation, motivation, attention, relevance, confidence and satisfaction. The results below have to be interpreted with care. The amount of respondents per course is low, for two of the courses only one respondent was interviewed. Chance could play a considerable role in these results.

Possible barriers for motivation

With regard to course one, there were no barriers for motivation for the online learners. The respondent indicated that she had both the means and the experience to be able to do the online course. Besides that, she only spent 45 minutes on the course which is a very short period of time.

With regard to course two, there were very little barriers for motivation for the online learners. One respondent indicated that he had no experience with online learning before he started the course. Other than that, all respondents had the means and experience to be able to do the online course. The course was fairly short, it took the respondents 20 hours to finish.

With regard to course three, there were some barriers for motivation for the online learners. Although all respondents had a computer with internet and were familiar with using it, the majority indicated that this was their first experience with online learning. Next to this, the course lasted 12 weeks which is a long time to stay motivated.

With regard to course four, there were very little barriers for motivation for the online learners. The respondent indicated that he had no experience with online learning before starting this course. The respondent had experience with computers and internet and had a computer available. Besides this, the course only took him 4.5 hours which is a very short period of time.

Intrinsic motivation

With regard to course one, the online learner was intrinsically motivated. Although the respondent was not intrinsically motivated according to the definition of Song (1998, learners with intrinsic motivation engage in tasks for the pleasure that comes from that task), the motivation came from herself and not from another person. The respondent started the course voluntary to improve her job performance and was interested in the subject beforehand. The respondent did not receive any support from her supervisor or colleagues but she indicated that she did not wanted or needed any support. One negative point is that the respondent said she did not really enjoy the activities in the course.

With regard to course two, the online learners were not intrinsically motivated. The respondents were motivated by another person (their superiors) instead of by themselves. According to the definition of Song (1998), the respondents were not intrinsically motivated as well. All respondents indicated that they started the course because it was mandatory. Only one of them said she would have done the course even if it was not mandatory. On top of that, the respondents did not enjoy the activities in the course at all. Striking was that none of the respondents received any support from their superior or colleagues but they indicated that they did not want or need support for this course. Next to this, the respondents were not really familiar with the course subject.

With regard to course three, all online learners were strongly intrinsically motivated. The majority of the respondents were intrinsically motivated according to the definition of Song (1998). Also, all of the respondents motivated themselves and were not motivated by someone else. All respondents started the course voluntary out of personal interest and to improve their job performance. They all were very interested in the subject of the course before they started. Also, the majority of the respondents received support from their family. One respondent did not receive support, but indicated that he did not needed or wanted it. On top of that, the majority of respondents really enjoyed doing the course activities and assignments.

With regard to course four, the online learner was somewhat intrinsically motivated. Although he was not intrinsically motivated according to the definition of Song (1998), he motivated himself and was not motivated by an external person (for instance his superior). The respondent did not enjoy any of the course activities. This was mainly because he expected the course to be different and it turned out that this course was not very useful for him. The respondent started voluntary, to improve his job performance. No support was received, but he respondent indicated he did not need or want any support.

Motivation

With regard to course one, the online learner felt motivated in general. The respondent indicated she stayed motivated because of the professional layout of the course, the structured design and the fact that as a learner you know exactly what to expect. Also, the course material kept her motivated because it was relevant. There were no moments of de-motivation because the respondent was able to scan the course for relevant information and skip the de-motivating parts.

With regard to course two, the online learners felt pretty motivated in general. The majority of respondents indicated they felt motivated because they wanted to finish the course successfully. One respondent was not motivated because the course structure was chaotic and because there was no course syllabus to reread the course material. This respondent was the only one who did not finish the course. Although the course material was not motivating for most of the respondents, only one of them indicated being really de-motivated during the course.

With regard to course three, the online learners were somewhat motivated in general. Two respondents felt not really motivated during the course, because of the difficulty of the course and the amount of work it took. The other respondents felt motivated because they learned new and relevant things, they enjoyed doing research on the subject, and because they wanted to finish the course without giving up. Only one of the respondents did not finish the course and quit early. The course material was motivating for two respondents. The instructor played a specific role in motivating all of the respondents by giving detailed feedback on assignments. Fellow learners played no role in motivating the respondents, they all indicated that this was a drawback of the course. On top of this, half of the respondents indicated that there were moments when they felt de-motivated. Mainly because the assignments were difficult and constituted a big challenge.

With regard to course four, the respondent felt not motivated in general. The respondent felt not motivated because he missed a syllabus to reread the material, there was a lot of text, and the practice questions did not match the questions at the exam. The respondent did not pass the exam and felt de-motivated during the course.

Attention

With regard to course one, the interest and curiosity of the learner was somewhat maintained. The respondent indicated that she found the course interesting (because of the direct applicability) but the course material itself could not keep her attention.

With regard to course two, the interest and curiosity of the learners was somewhat maintained. The majority of the respondents indicated that the course material could not keep their attention. All respondents indicated that they thought the course was pretty interesting, because it related to their field of work. The respondents added that the course was too general to really focus on one subject of interest.

With regard to course three, the interest and curiosity of the learners was maintained. Only one respondent indicated that she didn't think the course was interesting and the course could not keep her attention. The other respondents indicated that they found the course very interesting because they all learned new things about the subject. Next to this, the course material kept their attention. Mainly because the course material was closely related to the assignments.

With regard to course four, the interest and curiosity of the learner was maintained. The respondent indicated that the course was pretty interesting because the material was adapted to the company where he worked. Also, he indicated that the course kept his attention most of the time.

Relevance

With regard to course one, course content and objectives related to learner interest and needs. The course related to both professional goals and experience with the subject of the learner. The only negative point was that the respondent expected transfer of training. Afterwards, she could not use what she learned in practice, because the course focussed too much on theory.

With regard to course two, course content and objectives did not really relate to learner interest and needs. The majority of the respondents did not have any learning goals, because the course was mandatory and their only goal was to pass the course test. All respondents indicated that the course matched with their knowledge about the subject. Next to this, most respondents indicated that they did not expect any transfer of training and that afterwards, this transfer did not happen. Mainly because it is an introductory course with mostly general information about the organization.

With regard to course three, course content and objectives strongly related to learner interest and needs. For all respondents, the course related to personal goals. Only one respondent indicated that the course did not exactly match her knowledge about the subject because the instructor assumed some knowledge she did not have. On top of that, all respondents expected transfer of training during the course and after finishing the course, they could all use what they learned in their work or personal lives.

With regard to course four, course content and objectives did not really relate to learner interest and needs. The course matched the goals of the respondent and his knowledge about the subject. But the respondent indicated he did not expect transfer of training during the course because the knowledge seemed not directly applicable. Afterwards, the knowledge was indeed not applicable so there was no transfer of training.

Confidence

With regard to course one, the confidence of the learner was enhanced. The respondent was confident that she would successfully finish the course and that she personally had a lot of influence on succeeding.

With regard to course two, the confidence of the learners was enhanced. The respondents were all confident that they would successfully finish the course. Mainly because the course level was pretty low in their view. Next to this, all respondents were convinced that they personally had a lot of influence on succeeding.

With regard to course three, the confidence of the learners was enhanced. The respondents were all confident that they would successfully finish the course. This was because the respondents had positive experiences with learning in the past. Also, all respondents indicated that they were convinced that they personally had a lot of influence on succeeding.

With regard to course four, the confidence level of the learner was enhanced. The respondent was confident that she would successfully finish the course and that she personally had a lot of influence on succeeding.

Satisfaction

With regard to course one, satisfaction of the learner with the course was not enhanced. The respondent did not feel satisfied with what she did and learned during the course. This was mainly because the course did not bring her to the desired level of knowledge. The respondent also indicated that she didn't feel appreciation by her superior, but added that she didn't need or want appreciation in this area.

With regard to course two, satisfaction of the learner with the course was not enhanced. All respondents indicated that they did not feel satisfied with what they learned and did during the course. One respondent said she felt satisfied afterwards, because she passed the test. None of the respondents felt appreciated by their superior or colleagues, but they indicated that they did not need appreciation.

With regard to course three, satisfaction of the learners with the course was enhanced. All respondents indicated that they were satisfied with what they learned. Because of the challenge, one respondent is proud of what she achieved. Two respondents indicate that they felt appreciated by the other learners or by the instructor. Mainly because of the online discussions and the feedback from the instructor. Also the fact that this course is voluntary may enhance the satisfaction of the learners.

With regard to course four, satisfaction of the learner with the course was not enhanced. The learner indicated that he was not satisfied with what he learned, because the course was not what he expected. He also did not feel appreciated by his superior, but added that he did not need or want appreciation in this area.

5.4.2 Results instrument regarding Dutch online courses

In addition to the interviews, the four courses were evaluated using the instrument. This evaluation resulted in 54 scores between one and five for each of the four courses. A score of one means that the statement in the item is judged as being not true and a score of five means that the statement in the item is judged as being very true. The scores were imported in SPSS, a program for statistical analysis. The mean scores for every course were computed, as well as mean scores for each of the ARCS elements. To recapture, Attention refers to engaging and maintaining the interest and curiosity of the learner, Relevance refers to relating course content and objectives to learner interest and needs, Confidence refers to enhancing the confidence of the learner and Satisfaction refers to enhancing the satisfaction of the learner with the course. The results are described in table eight. Course one is 'Oracle iLearning: getting started with Oracle iLearning', course two is 'Operations deel 1', course three is 'Textual criticism and textual history of the Old Testament' and course four is 'Derivaten'.

Table 8

Mean scores of the Dutch online courses

	Course 1	Course 2	Course 3	Course 4	Total
Attention	3.89	3.30	2.86	3.30	3.28
Relevance	3.67	2.31	2.56	2.23	2.67
Confidence	3.70	3.44	2.67	3.33	3.29
Satisfaction	2.75	2.80	2.00	3.00	2.55
Total	3.63	2.92	2.63	2.89	2.97

These results have to be interpreted with care, because of the small amount of online courses that were used. The differences between the courses are not necessarily significant. What do these results imply?

- Course one has the highest overall mean score, 3.63. This means that the statements in all items have been rated as being mostly true. In comparison to the other online courses, the course material of course one contains a pretty large amount of motivation enhancing elements. Attention scores particularly high in this course, apparently there are a lot of attention getting elements in this course.
- Course three has the lowest overall mean score, 2.63. This means that the statements in all items have been rated as being moderately true. In comparison to the other online courses, the course material of course three contains the smallest amount of motivation enhancing elements. Satisfaction scores particularly low, apparently there are few satisfaction enhancing elements in the course material of this course. This result is striking because this course is the only one where the learner has contact with an instructor and fellow learners which could both function as a source of motivation.
- The overall mean scores of course two and four are virtually the same, 2.92 and 2.89. This could be expected because the courses are very much alike and have been designed by the same company. The layout, course design and structure of both courses are virtually the same. In both courses, Attention scores the highest and Relevance scores the lowest. Apparently, there are not much elements to enhance Relevance.

5.4.3 Comparison of results

In the previous paragraphs, the results of both the interviews as well as the evaluation of the courses have been described. A comparison between these results will be the focus of this paragraph. This comparison serves multiple purposes. The first and primary purpose is to validate the instrument. On the basis of this validation, the main research question can be answered: what is the predictive value of the instrument which is designed to measure the motivating effect of online course material? Another goal is to find out whether the data provide additional elements which influence motivation of the learner, next to the tactics which have been determined in the ARCS Model of Motivational Design. These matters will be discussed in the current paragraph.

Validation of the instrument

When the results are roughly compared, they show some resemblance for the courses one, two and four. With regard to course three, the results between the instrument and online learners are far apart. The results are discussed in more detail below.

Looking at motivation, respondents from course one are motivated the most, this corresponds with the results of the instrument, where course one has the highest mean score. Other courses have lower mean scores. Course three stands out, because although the respondents indicate that they are somewhat motivated, the course has the lowest mean score.

Looking at Attention, the results of the instrument and online learners do not match. Respondents from course three and four indicate that their attention is kept, but these two courses have the two lowest mean scores from the instrument.

With regard to Relevance, respondents from courses two and four indicate that the course material is not really relevant. This corresponds with the mean scores from the instrument, which are lower for course two and four. Again, course three stands out. The respondents from course three indicated that the course was very relevant, but the course received a low mean score.

Confidence was judged the same by all the respondents. They were all confident that they would succeed. This resembles the mean scores for courses one, two and four, which are all high. It doesn't correspond with the mean score of course, three which is the lowest of them all.

Overall, Satisfaction was judged pretty negatively by the respondents. This opinion returns in the low mean scores for Satisfaction for the courses. Only the respondents of course three indicated that they were satisfied. This contradicts with the mean score of course three, which is very low.

The results from the instrument do not show a strong resemblance with the results from the interviews. There is some resemblance between the results of courses one, two and four, but the results of course three differ very much. One explanation of these differences in results is that course three is the only course where the learner has interaction with an instructor and other learners. This interaction is a factor which influences the motivation of the learner. The instrument is focussed on online course material only, so a lot of these factors cannot be measured. Because in the other courses there is no interaction with an instructor (in fact there is no instructor) or other learners, his problem does not occur.

This comparison shows that measuring motivation in different ways, yields somewhat different results. Therefore, this test of validity gives limited proof of the quality of the instrument. The absence of interaction with an instructor and other learners in an online course may be a condition for the proper use of the instrument as measurement instrument.

Additional motivation elements

During the interviews, respondents gave a variety of factors which influenced their motivation. Again, these implications have to be viewed with care, because the number of respondents for two of the courses is very low. Therefore these factors may not be representative. What were these factors? An overview can be found in table nine, as well as supporting statements from the respondents (factor 1-24). As an addition, the overview also includes motivating factors which are not linked with the course (factor 25-30).

Table 9

Overview of motivating factors according to the online learners that were interviewed

Motivating factors course material	Supporting statements from online learners
1. There is a clear statement of what the learner can expect from the course	"I expected something else and my motivation didn't benefit from that."
2. There is a regular book or syllabus next to the online material	"It doesn't read well from a computer screen." "You had to learn from the screen, if you wanted or not. The material should be available in different ways."
3. The portions of text are small	"It's not clear why internet as a medium is handy for this course. You're just reading lots of text."
4. The test questions reflect the course content	"The exam questions were different from the course content so I didn't make it."
5. The content is adjusted to the (work) situation of the learner	"With a standard course, it's hard to make a translation to your own organisation. Things go slightly different at other organisations and now you don't have to worry about that."
6. The course content contains a demonstration or practical example	"You know what's possible, but you have to figure out for yourself how this is possible and how to do it."
7. There are experts to consult about the subject	"With this course it's pleasant to have the possibility to consult a group of experts to ask them questions."
8. The course content is not boring and business-like	"It's introduced in a boring and business-like way. It was interesting enough to continue the course but it does not motivate to go on."
9. The design is professional	"The course looked professional, was very structured. That was motivating."
10. The design is well structured	"The course was very structured so you know exactly what to expect. This motivated me to go on."
11. The non relevant content can be skipped	"The fact that I went through the course in a diagonal way and took out the points that were interesting to me prevented that I became de-motivated."
12. There are practical assignments included	"I think with this course with an assignment every week you feel you're advancing, you're really learning something new all the time. I think that is a good motivation."
13. The tasks are challenging	"When you're in the middle of slogging through, it's not always so enjoyable, but when you go through you see things and understand things. I did enjoy that."
14. The instructor gives content feedback	"The feedback that started coming was pretty clear and there were some areas where I could improve in. During the course I did get better in it."

15. There are online discussions	"Because we had discussions which were for me a big motivating factor. They make you think about your research, you think of more things."
16. The assignments are personalized	"I wanted to work on Ezra-Nehemiah, and all his assignments were from Kings or Amos."
17. The instructor gives encouraging feedback	"It was tremendously motivating to have the instructor say I think you're good at this, I would hate you to drop out."
18. The instructor introduces him/herself	"It would help a lot to know who he was, where he was coming from, what kind of ideas he had about the bible in general."
19. The course questions are thought-provoking	"The course kept my attention, some of the questions he asked were really thought-provoking."
20. There is a clear description of the required level of knowledge	"Expectations were communicated and there was no frustration."
21. The grading rubric is clear	"We didn't have one and I never knew where I stood."
22. Fellow students introduce themselves	"This step was skipped and need not have been. Then we might have been able to be more supportive of each other."
23. There is contact with fellow students	"It feels good if there's someone else who is also doing it. I can compete with that person, it gives me motivation."
24. The course level is explained	"The content is written on secondary education level. I decided that I could handle that."
25. Social pressure	"It's a failure if you don't finish the final test. There are 60 colleagues at work who passed it."
26. Professional attitude	"It's not for school anymore, you are now working and you have to set your priorities."
27. Resume building	"It would look good on my academic record."
28. Enjoyment of activities	"I always do my research and my work because I enjoy it."
29. Personal characteristic	"I'm not the kind of person who likes to quit. I don't give up easy."
30. The course is mandatory	"I had to do the course, if it wasn't mandatory I wouldn't have done it."

Comparing these motivating factors with the strategies from Keller (1983), Keller and Kopp (1987), Keller & Suzuki (1988), Keller (1990), Keller & Burkman (1993), the majority of the factors from table nine fit in with the motivational strategies from Keller. Most of the motivating factors from table nine are specific examples of Keller's strategies directed at online learning. For instance, one strategy (Keller, 1983) is "enable trust and provide opportunities for no-risk, cooperative interaction". Two context-specific examples related to enabling a trusting environment are number 18 (the instructor introduces himself) and 22 (fellow students introduce themselves). A specific example related to cooperative interaction is number 15 (there are online discussions). To conclude, the motivating factors in online learning as described by the respondents all fit within the ARCS Model of Motivational Design. Most factors are not literally the same as the ARCS strategies, but they are an "online interpretation" of the original strategies. With some adjustments, most of the ARCS strategies can be interpreted for online learning. Still, it would be helpful to use the context-specific elaborations from the online learners and those from the instrument as examples of those strategies. Keller & Suzuki (1988) set up motivational strategies for Instructional Software Design. Because of new (technical) developments in this area and the use of internet applications, a new set of motivational strategies for Online Course Design would be a valuable addition.

5.5 Conclusion

The results of the four research activities to determine the quality of the instrument have been discussed in this chapter. Two quantitative activities have been employed, the evaluation with the American online courses and the determintation of the inter-rater reliability. Two qualitative activities have been employed, the expert evaluation and the evaluation with the Dutch online courses and online learners.

The evaluation with the seven American online courses resulted in an adjustment of several items, which have been defined more clearly and objectively. The determination of the inter-rater reliability showed that the inter-rater reliability for the two raters of the seven American courses was substantial. The expert evaluation resulted in the realisation that additional qualitative data was needed, from the viewpoint of the online learner. This led to the fourth research activity, the evaluation with the online learner. This evaluation showed that the outcomes of the instrument regarding the motivating effect of four Dutch online courses were different from the outcomes of the online learners.

With the results of these research activities in mind, the research question can be answered. What is the predictive value of the instrument which is designed to measure the motivating effect of online course material? There can be concluded that the predictive value of the instrument is low. In the evaluation it turned out that there is no relation between the number of items present in online course material and the motivating effect of that specific course. The next chapter will go into the research question more in detail.

6. Discussion

The previous chapter discussed the results from the instrument and the interviews. In this chapter, these results will be used to draw conclusions. The purpose of this master's thesis was to find out what the predictive value is of the instrument which is designed to measure the motivating effect of online course material. Before this the research activities will be recaptured shortly. First, relevant concepts have been explored in literature. This exploration led to a conceptual framework. With this framework as a basis, items have been selected and constructed. Second, an instrument has been designed which was intended to measure the motivating effect of online course material. Third, the quality of the instrument has been determined by employing both qualitative as well as quantitative research activities: an evaluation with seven American online courses, the determination of the inter-rater reliability, an expert evaluation and an evaluation with online learners from four Dutch online courses.

In paragraph 6.1 the main research question will be answered and the research will be shortly recaptured. Next, in paragraph 6.2, points of discussion will be treated. Paragraph 6.3 provides a reflection on the research process and 6.4 concludes with the relevance of this master's thesis.

6.1 Main research findings

At this point, the research question can be answered. What is the predictive value of the instrument which is designed to measure the motivating effect of online course material?

This question refers to the predictive validity of the instrument, which is the extent to which an instrument can predict future behaviours or results (Philips, 1997). There has to be concluded that the predictive value of the instrument is low. This means that there is no relation between the number of items present in the online course material and the motivating effect the online course material has on the online learner. A high number of items present in the online course material does not mean that the motivating effect on the learner is high. Consequentially, a low number of items present in the online course material, does not mean that the motivating effect on the learner is low.

Important in this respect is the quality of the instrument. As can be recalled, four activities have been undertaken to improve that quality. First, the instrument was evaluated using the online courses. This resulted in an improvement of the formulation of the items and the rater instruction. Some items, which were not measurable, were dropped. Second, the inter-rater reliability has been calculated. According to this measure, there is reasonable evidence that the criteria for scoring have been uniformly defined. A third activity to improve the quality has been the expert evaluation. In the end, the expert evaluation applied to the utility of the instrument and not so much on the quality of it. The final and most extensive activity to improve the quality of the instrument has been the evaluation with the online learners. After comparing both measures of motivation, it turned out that there was some evidence of the validity of the instrument. This evidence was clearly not very strong. There is a difference between the extent to which courses are motivating according to the instrument and the extent to which courses are motivating according to the online learner.

What does this mean for the instrument? The fact that the instrument has little predictive value and is not very suitable to be used the way it was designed, does not mean it is of no use. The outcomes of the expert-review prove very valuable in this respect. According to this research, there can be concluded that the instrument is no measurement instrument. It is in fact an overview of motivational tactics meant for online courses, classified according to the ARCS Model of Motivational Design. A proper name would be the "ARCS-based motivation tactics list for online course material". A first design of such a list is shown in appendix five. When such a list is used, a few conditions need to be considered. First, not every tactic is suitable for every online course. Depending on the intentions of the course, some tactics might be more suitable than others. For instance, if the course has no intention to stimulate any cooperation between learners, these tactics about group work are not suitable. Next, one first has to decide what way motivation needs to be enhanced (through Attention, Relevance, Confidence or Satisfaction) before randomly implementing examples. This can be done by performing an audience analysis where the motivational needs of the target group are determined. Finally, one needs to have insight in the learner's needs and preferences. Each learner is different and the examples need to connect to the learner as much as possible. Although Attention, Relevance, Confidence and Satisfaction are indicators of learner motivation, there is more to it. Social pressure, professional attitude, resume building, personal characteristics are some of the additional factors which influence the motivation of the learner.

What is the added value of the motivation tactics list with respect to existing motivation literature, in particular the ARCS Model of Motivational Design? There can be concluded that these tactics are an addition to the existing literature. The tactics provide an extensive overview of context specific examples to enhance motivation. In motivation theories, little attention is given to practical motivation tactics with regard to online learning. The modified ARCS Model of Motivational Design (Cornell & Martin, 1997) only provides general principles, for instance "content in online learning must be presented in such a way that it motivates the student to attend to the information". With specific examples, it becomes much easier to implement this advice. Such an extensive overview directed at online learning can be valuable for different interested parties. Designers of online courses and online course instructors can benefit from these specific examples. Depending of the type of course and the goals of the course, they can implement the desirable tactics.

In addition, it is interesting to see, what other external factors influence the motivation of the online learner. One factor is personal characteristics. Personal characteristics have an effect on motivation. People who see themselves as a die-hard or go-getter will not quit easily and may even put a lot of effort in reaching their goals. Their personality trait has a positive effect on their motivation. Professional attitude is also an example of a personal characteristic. A second factor is social pressure. The fear of failing in front of others or peer pressure can also have a positive effect on motivation. If all your colleagues passed the online course test, you are bound to be strongly motivated to do the same. Resume building has also to do with social pressure. A final external factor which influences motivation is whether or not the course is mandatory. This can have a negative as well a positive effect on the motivation of the learner.

6.2 Points of discussion

Looking back at this research and reflecting on the results and conclusions, some points of discussion emerge. These points will be discussed in the present paragraph. Discussed will be intrinsic and extrinsic motivation, active and passive motivation and personal differences.

Intrinsic and extrinsic motivation. First the definitions of these two concepts will be discussed. Intrinsic motivation has been discussed already. According to Song (1998), intrinsically motivated activities are ones for which there is no apparent reward except the activity itself. So people with intrinsic motivation engage in tasks for the pleasure that comes from that task. Extrinsic motivation, on the other hand, implies motivational efforts for something other than the given tasks themselves. Something other can be: a good grade, getting into college, getting a job or gaining respect. In this master's thesis, the role of intrinsic and extrinsic motivation has been left out. The reason for this is that Keller does not distinguish between intrinsic and extrinsic motivation in his definition of motivation (Song, 1998): motivation refers to the choices that people make as to what experience or goals they will approach or avoid, and the degree of effort they will exert in that respect (Keller, 1983). Attention, Relevance, Confidence and Satisfaction can result from extrinsic as well as intrinsic factors. Looking at the results of the interviews with the online learners, it was striking that only respondents from course three were intrinsically motivated. It is no coincidence that course three was the only voluntary course. If someone else forces a person to enroll in a course, chances that that person engages in course tasks for the pleasure that comes from those tasks, are small. This leads to the following point of discussion.

Motivating oneself or being motivated In the first case, it is a matter of active motivation and in the second case, it is a matter of passive motivation. When a superior tells his/her employees they must enroll in a specific online course, the employees have been motivated by someone else. Their motivation is passive. When an employee decides he/she has to improve his/her skills and enrolls in an online course, he/she motivated herself. His/her motivation is active. In the case of passive motivation, it is important to include elements in the course which stimulate active motivation.

Again, the definition of Keller does not distinguish between passive and active motivation. Attention, Relevance, Confidence and Satisfaction can result from active as well as passive factors. It depends on the characteristics of the learner which kind of motivation works best. So, there is a difference between active and passive motivation but its role needs to be defined.

Personal differences. As has been said, each learner is different and it depends on their characteristics which motivation tactics have the most effect. There are a variety of differences between learners (Jonassen & Grabowski, 1993):

- Level of prior knowledge
- Cognitive processing variables; learners process information in different ways
- Personality variables; one personality variable is that learners may be impulsive or reflective
- Strategies for learning
- Beliefs about learning and thinking; student beliefs about knowledge and what it means to understand contribute to the individual variability that can be seen in the effects of teaching
- Demographics; gender, age and ethnic background contribute special qualities to learners

Personal differences between learners were outside the scope of this research.

Looking at the results from the interviews, it was striking that some characteristics of learners seemed to be strong motivators. One respondent was enrolled in a mandatory course. Her drive not to give up and to succeed had a substantial influence or her motivation. If she wasn't such a diehard, she might not have successfully finished the course. Personality traits such as discipline, persistence, the urge to prove oneself do play a role when motivation is lacking or low.

6.3 Reflection on research process and methods

As has been indicated in the first chapter, most research activities have been undertaken within the framework of the original research question: to what degree have motivational elements been integrated in ten online courses perceived as of high quality by professional organizations and higher education institutions? Next to this, the research was conducted with the limitations of the research project of Utah State University. In this paragraph, there is reflected on the research process and methods used. The first question that is interesting is: what research activities would have been undertaken if the starting point was determining the quality of a motivation instrument?

The first step is the design of an agreement scale which is administered to respondents. An advantage of using respondents compared to online courses (and raters) is that respondents can provide much more information than online course material only. For example, online course material does not provide any information about feedback from the instructor but the online learner can provide information about the content and effect of the feedback. The items of the instrument are similar to the items of the current instrument. In addition to existing literature about motivation, online learning and adult learning, prospective respondents and motivation experts can be used as a source for the construction of the items. In this master's thesis, the instrument was validated by comparing the results of the instrument with the results of the evaluation with the online learner. Another possibility would be to use the factors that are judged as being motivating by online learners as input for the instrument.

The second step is determining the quality of the instrument by looking at validity and reliability.

- Concerning reliability, one activity is eliminating the ineffective items from the instrument. A pilot group of some 50 respondents is asked to respond to the items (Henerson, Morris & Fitz-Gibbon, 1987). On the basis of these responses, an item analysis can be conducted. This way, a pool of effective items remain.
- Concerning validity, one activity is to reduce response bias (Philips, 1997). Respondents should be encouraged to provide candid responses. Another activity is using experts' opinion to determine construct validity, the extent to which the instrument represents the construct it purports to measure (Philips, 1997). A group of experts agree that the instrument, in their opinion, is an accurate measurement of the construct.

A second question is: looking back on the research activities, what could be area's of improvement? Two activities than could be improved are the expert evaluation and the evaluation with the online learner. Another aspect are threats to validity. The expert evaluation proved very useful, but it would have been more powerful if the specific questions had been answered. This way, the quality of the items could have been improved further. To recall, these questions were 1) do the items of the instrument fit properly in each of the categories of the ARCS frame? 2) are the items of the instrument all motivating elements? and 3) is the instrument complete, are there

important motivating elements missing? The answers to these questions would also have been meaningful for the instrument as motivation tactics list for online learning.

A second area of improvement is the evaluation with the online learner. It proved to be difficult to find companies or institutions that used online courses. The vast majority of the companies that were contacted used blended learning, which combines online with face-to-face approaches. Another difficulty was to find courses that matched the assumptions under which the instrument was designed. The instrument assumed that the online course included an instructor and fellow students. These assumptions were based on the way the American online courses were designed. Unfortunately, only one of the four Dutch online courses satisfies these assumptions. As a result, a lot of the items of the instrument omitted. Next to this, with two courses, only one respondent was interviewed. In this situation, it would be better to have four respondents for every course. With data from only one respondent, conclusions have to be drawn with care because coincidence plays a role.

With regard to some research activities threats to validity have to be reckoned with. What are those threats? With regard to the evaluation with the seven American online courses, the number of courses is fairly low. Because no conclusions have been drawn from these results (only one case is treated as an example) the threat is not applicable. The courses serve as pilots for constructing and testing the instrument. A clearly present threat concerns the evaluation with the online learners from four Dutch online courses. The number of courses and accompanying online learners is low. Only four courses with respectively one, three, four and one online learner(s) per course. The results from these low number of courses and respondents may very well be based on coincidence so they have to be interpreted with great care. Had the number of courses and respondents per course been larger, different results may have come out. There is no way of knowing if these nine respondents are representative for the online learner in general. With the available time and resources it was not possible to obtain more respondents. In an ideal situation, fifty respondents per course would rule out this validity treat (Henerson, Morris & Fitz-Gibbon, 1987).

6.4 Relevance of the research

In the first chapter, the relevance of this master's thesis and its outcomes have been described. Several groups were identified to benefit from this research. Now that the purpose of the instrument has changed, the instrument no longer is a motivation measurement instrument, but a motivation tactics list for online learning. This tactics list can be deployed as a job-aid to design online courses. It offers support and relevant examples for including motivational elements in online course material. An analysis of the target group can provide more detailed information about the motivation level and preferences of the learners. Visser, Plomp, Amirault & Kuiper (2002) recommend the following steps for performing an audience analysis. The first step is retrieving detailed information about the learners: social and cultural background, reasons for taking the course, learner expectations and expected motivational problems. The second step is conducting the audience analysis, which consists of a social/geographic/motivational profile. Step three is to define motivational objectives and the content on the basis of the audience analysis. This way, the motivational tactics that are employed are based on the needs of the learners. The audience analysis can be employed to determine which tactics (Attention-getting, Relevance-enhancing, Confidence-enhancing or Satisfaction-enhancing) to include in the course. For example, the audience analysis may indicate that many learners are uncertain if they are able to finish the course successfully because they are uncertain about their required academic background . Motivational tactics should aim at enhancing the learner's confidence in that case.

Examples are: (1) the course clearly specifies the skills and knowledge that will help the learner succeed at a task, or (2) the instructions to the learner clearly describe the requirements to master the content of the course.

Relevant parties are online course designers because they can use the tactics list to add motivational elements to their online courses. The online course instructor also benefits from the tactics list because the list provides him with examples of actions he or she can undertake in order to motivate the online learners. In this case, an audience analysis is also recommended. The last relevant party is the online learner. Although indirect, the online learner benefits from courses which provide quality material but also contain motivating elements in order to be successful.

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Appendix 1: Concept version of the ARCS-based instrument

Interest and curiosity of the learner are engaged and maintained 1=not true 2=slightly true 3=moderately true 4=mostly true 5=very true	
1. The course provides novel, surprising or unusual events *(Look for audio/visual events and events in course content)*	1 2 3 4 5 NA
2. The home- or main page has an eye-catching visual or title	1 2 3 4 5 NA
3. The course avoids effects that distract the learner *(Look for audio/visual effects)*	1 2 3 4 5 NA
4. Course content contains anecdotes and examples	1 2 3 4 5 NA
5. Course content is written in an active style	1 2 3 4 5 NA
6. Course content and sentences are of moderate length	1 2 3 4 5 NA
7. The course poses questions or has the learner generate questions *(Look for course tasks. A question is about recalling facts and well-learned procedures)*	1 2 3 4 5 NA
8. The course poses problems to solve or has the learner generate problems to solve *(Look for course tasks. A problem is a task of which the solution method is not known in advance and causes the learner to acquire new information)*	1 2 3 4 5 NA
9. The course encourages the learner to post articles and resources	1 2 3 4 5 NA
10. The course provides a place for the learner to post course related questions	1 2 3 4 5 NA
11. The course provides multiple elements of instruction *(Look for reading material, tasks, illustrations, video, etc)*	1 2 3 4 5 NA
12. The course provides multiple sources for performing tasks *(Look for course content, books, websites, articles, etc)*	1 2 3 4 5 NA
13. The course provides multiple assessment techniques *(Look for presentations, papers, reflection, tests, reports, portfolio's, multiple choice tests, etc)*	1 2 3 4 5 NA
14. The course has a consistent screen format which includes occasional variation	1 2 3 4 5 NA
15. The course provides multiple styles of content presentation *(Look for text, video, audio, pictures, etc)*	1 2 3 4 5 NA

Course content and objectives are related to learner interest and needs 1=not true 2=slightly true 3=moderately true 4=mostly true 5=very true	
16. Course content is directed at the student and uses personal pronouns	1 2 3 4 5 NA
17. Course content implies a friendly and welcoming tone	1 2 3 4 5 NA
18. Examples and concepts in course content imply to relate to real (work)situations	1 2 3 4 5 NA
19. The course uses multiple experiential techniques *(Look for discussions, simulations, field experiences, team projects, case studies, etc)*	1 2 3 4 5 NA
20. The course provides a biography of the instructor and of the learners	1 2 3 4 5 NA
21. The objectives of the course are clearly specified	1 2 3 4 5 NA
22. The course allows for the learners to choose or define their own objectives	1 2 3 4 5 NA
23. The utility of the course is clearly specified or provided in examples	1 2 3 4 5 NA
24. Course content and tasks use multiple learning styles *(Look for content that fits 1. convergers who like to reach closure quickly by finding concrete solutions to problems and making decisions, 2. divergers who have an awareness of meaning and values and enjoy brainstorming and imagining alternative solutions, 3. assimilators who like to take in lots of information and build theoretical models based on that information, 4. accommodators who are more action-oriented, taking risks and teaching themselves through trial and error)*	1 2 3 4 5 NA
25. The course uses multiple teaching strategies *(Look for collaborative learning/cooperative learning, discovery-based learning, engaged learning, problem-based learning, experiential learning, etc)*	1 2 3 4 5 NA
26. The course enables an environment that implies trust *(Look for personal information about the instructor and the learners, professional design, use of passwords, introductory message from the instructor)*	1 2 3 4 5 NA
27. The course provides opportunities for choice *(Look for choice between tasks, choice of topic in tasks, choice in delivery date, choice in resources, choice of objectives, choice in working together or individual)*	1 2 3 4 5 NA
28. The course includes options that allow learners to work together *(Look for small group discussions or chats, collaborative work on tasks, peer review of papers or products, brainstorming, etc)*	1 2 3 4 5 NA
29. The course provides opportunities for autonomous and self-directed learning *(Self directed is free from external control and constraint in action and judgment. Look for tasks that are not assessed, unrecorded chat sessions, unmonitored discussions, instructor acting as a coach in stead of teacher, degree of leaner freedom)*	1 2 3 4 5 NA
30. Course content and the introduction is written in a way that implies respect for the learner	1 2 3 4 5 NA
31. The course provides leadership responsibilities *(Look for project/discussion leader options, options to switch roles with instructor, evaluating work of peers)*	1 2 3 4 5 NA

Confidence of the learner is enhanced 1=not true 2=slightly true 3=moderately true 4=mostly true 5=very true	
32. The initial perception of the course implies to be easy	1 2 3 4 5 NA
33. The course clearly specifies the skills and knowledge that will help the learner succeed at a task or the course	1 2 3 4 5 NA
34. Course content is well organized and structured	1 2 3 4 5 NA
35. The course provides advance organizers, summaries or reviews *(Look for charts, diagrams, concept maps, tasks which require the learner to relate new material to previous knowledge, summaries and reviews)*	1 2 3 4 5 NA
36. The course provides for the learner to interact with the instructional material, the instructor, and other students	1 2 3 4 5 NA
37. The course supports the sharing of tips and tricks by the learners and instructor	1 2 3 4 5 NA
38. The course provides multiple achievement levels	1 2 3 4 5 NA
39. The course provides personal opportunities for experiencing success *(Look for non-complex individual tasks and activities at the beginning or middle of the course or module)*	1 2 3 4 5 NA
40. Course content is organized from easy to difficult	1 2 3 4 5 NA
41. Tasks are organized from easy to difficult	1 2 3 4 5 NA
42. There is a match between performance requirements and course goals *(Look for goals and objectives and tasks)*	1 2 3 4 5 NA
43. The course provides feedback that supports the learner's ability and effort *(Look for feedback in threaded discussion, message boards, etc)*	1 2 3 4 5 NA
44. The course provides opportunities for control *(Look for control over pacing, order and time schedule)*	1 2 3 4 5 NA
45. The course provides access to the main menu at all times	1 2 3 4 5 NA
Satisfaction of the learner with the course is enhanced 1=not true 2=slightly true 3=moderately true 4=mostly true 5=very true	
46. Learning activities imply to be applicable to the learner's work	1 2 3 4 5 NA
47. The course provides opportunities to use newly acquired knowledge or skill in a real-life or simulated setting	1 2 3 4 5 NA
48. Rewards are customarily or follow naturally from a task *(Look for grading and feedback intentions)*	1 2 3 4 5 NA
49. The course encourages the learner to share subject related experiences *(Look for tasks, discussions, collaboration with learners)*	1 2 3 4 5 NA
50. The course provides informational feedback	1 2 3 4 5 NA
51. The course provides motivational feedback	1 2 3 4 5 NA
52. Learner accomplishment is rewarded *(Look for grading system)*	1 2 3 4 5 NA
53. Standards and consequences for accomplishment maintain consistent	1 2 3 4 5 NA

54. The course offers helpful guidance *(Look for a help/new student/getting started/technical problems-section)*	1 2 3 4 5 NA
55. The course brings attention to the intrinsic enjoyment that the learner feels as a result of accomplishment	1 2 3 4 5 NA
56. The course provides the learner the opportunity to reflect on her accomplishment *(Look for reflection tasks)*	1 2 3 4 5 NA
57. The course provides the learner with additional materials and sources about related areas	1 2 3 4 5 NA

Appendix 2: Final version of the ARCS-based instrument

Interest and curiosity of the learner are engaged and maintained		1=not true 2=slightly true 3=moderatel y true 4=mostly true 5=very true NA=not applicable
1. The home or main page has an eye-catching visual or title	1= there is no eye-catching visual or title on the home page 2= there is a slightly eye-catching visual or title on the home-page 3= there is a moderately eye-catching visual or title on the home page 4= there is an eye-catching visual or title on the home-page 5= there is a very eye-catching visual or title on the home page	1 2 3 4 5 NA
2. The course contains effects that distract the learner from course content or tasks*	Look for distracting audio, video and visual effects or links to external websites which place the learner outside the navigation frame of the course. 1= there are no distracting effects in the course 2= few parts of the course (25%) contain distracting effects 3= some parts of the course (50%) contain distracting effects 4= most parts of the course (75%) contain distracting effects 5= all parts of the course (100%) contain distracting effects	1 2 3 4 5 NA
3. Course content contains anecdotes and examples	1= course content does not contain any anecdotes and examples 2= few course content (25%) contains anecdotes and examples 3= some course content (50%) contains anecdotes and examples 4= most course content (75%) contains anecdotes and examples 5= all course content (100%) contains anecdotes and examples	1 2 3 4 5 NA
4. Course content is written in an active style	Look for actively used verbs, for example: Active = The experiment examines the relationship between the two theories. Passive = The experiment is conducted so that the relationship between the two theories can be examined. 1= course content is not written in an active style 2= few course content (25%) is written in an active style 3= some course content (50%) is written in an active style 4= most course content (75%) is written in an active style 5= all course content (100%) is written in an active style	1 2 3 4 5 NA
5. Course content and sentences are of moderate length	Look for long sentences which have more than 25 words. Look for excessive scrolling because of the length of course content. 1= none of the course content and sentences are of moderate length 2= few course content and sentences (25%) are of moderate length 3= some course content and sentences (50%) are of moderate length 4= most course content and sentences (75%) are of moderate length 5= all course content and sentences (100%) are of moderate length	1 2 3 4 5 NA

6. Course content poses questions or has the learner generate questions in order to learn the content	Look for course tasks which focus on an isolated component of a task or problem, not on the task or problem as a whole (Merrill). 1= tasks do not pose questions or have the learner generate questions at appropriate opportunities 2= few tasks (25%) pose questions or have the learner generate questions at appropriate opportunities 3= some tasks (50%) pose questions or have the learner generate questions at appropriate opportunities 4= most tasks (75%) pose questions or have the learner generate questions at appropriate opportunities 5= all tasks (100%) pose questions or have the learner generate questions at appropriate opportunities	1 2 3 4 5 NA
7. Course content poses problems to solve or has the learner generate problems to solve in order to learn the content	Look for complex cognitive skills (Merriënboer) in course tasks: - Complex cognitive skills contain of sub-skills. - The performance of sub-skills consists of both automatic processes (these processes occur with little or no additional effort, are driven by external data, and are not prone to errors) and of controlled processes (they require focussed attention, are easily overloaded, and prone to errors). - The performance of complex cognitive skills and sub-skills is goal-directed. 1= tasks do not pose problems to solve or have the learner generate problems at appropriate opportunities 2= few tasks (25%) pose problems to solve or have the learner generate problems at appropriate opportunities 3= some tasks (50%) pose problems to solve or have the learner generate problems at appropriate opportunities 4= most tasks (75%) pose problems to solve or have the learner generate problems at appropriate opportunities 5= all tasks (100%) pose problems to solve or have the learner generate problems at appropriate opportunities	1 2 3 4 5 NA
8. The course encourages the learner to post articles and resources	Look for tasks which encourage the learner to post articles and resources. 1= tasks do not encourage the learner to post articles and resources 2= few tasks (25%) encourage the learner to post articles and resources at appropriate opportunities 3= some tasks (50%) encourage the learner to post articles and resources at appropriate opportunities 4= most tasks (75%) encourage the learner to post articles and resources at appropriate opportunities 5= all tasks (100%) encourage the learner to post articles and resources at appropriate opportunities	1 2 3 4 5 NA

9. The course encourages the learner to post course related questions	Look for tasks which encourage the learner to post course related questions. 1= tasks do not encourage the learner to post course related questions 2= few tasks (25%) encourage the learner to post course related questions at appropriate opportunities 3= some tasks (50%) encourage the learner to post course related questions at appropriate opportunities 4= most tasks (75%) encourage the learner to post course related questions at appropriate opportunities 5= all tasks (100%) encourage the learner to post course related questions at appropriate opportunities	1 2 3 4 5 NA
10. The course provides multiple strategies of instruction	Look for reading material, tasks, illustrations, video, audio, modeling, observation, group work, demonstration, guided and unguided practice, etc. 1= the course provides very few instruction strategies 2= the course provides few instruction strategies 3= the course provides some instruction strategies 4= the course provides a considerable amount of instruction strategies 5= the course provides plenty instruction strategies	1 2 3 4 5 NA
11. The course provides multiple sources for performing tasks	Look for course content, books, external websites, articles, experts, etc. 1= the course provides very few sources for performing tasks 2= the course provides few sources for performing tasks 3= the course provides some sources for performing tasks 4= the course provides a considerable amount of sources for performing tasks 5= the course provides plenty sources for performing tasks	1 2 3 4 5 NA
12. The course provides multiple assessment techniques	Look for presentations, papers, reflection, tests, reports, portfolios, multiple choice tests, etc. 1= the course provides very few assessment techniques 2= the course provides few assessment techniques 3= the course provides some assessment techniques 4= the course provides a considerable amount of assessment techniques 5= the course provides plenty assessment techniques	1 2 3 4 5 NA
13. The course has a consistent screen format which includes occasional variation	1= the course does not have a consistent screen format 2= few parts of the course (25%) have a consistent screen format with very much variation 3= some parts of the course (50%) have a consistent screen format with much variation 4= most parts of the course (75%) have a consistent screen format with considerable variation 5= all parts of the course (100%) have a consistent screen format with occasional variation	1 2 3 4 5 NA
14. The course provides multiple styles of content presentation	Look for text, video, audio, pictures, schema, symbols, etc. 1= the course provides very few styles of content presentation 2= the course provides few styles of content presentation 3= the course provides some styles of content presentation 4= the course provides a considerable amount of styles of content presentation 5= the course provides plenty styles of content presentation	1 2 3 4 5 NA

Course content and objectives are related to learner interest and needs		1=not true 2=slightly true 3=moderately true 4=mostly true 5=very true NA=not applicable
15. Course content is directed at the learner and uses personal pronouns	Look for learner-directed content with personal pronouns, for example: Directed: you are able to use your observation skills. Non-directed: the student will be able to use her observation skills. 1= course content is not directed at the learner and uses no personal pronouns 2= few course content (25%) is directed at the learner and uses personal pronouns 3= some course content (50%) is directed at the learner and uses personal pronouns 4= most course content (75%) is directed at the learner and uses personal pronouns 5= all course content (100%) is directed at the learner and uses personal pronouns	1 2 3 4 5 NA
16. Course content implies a friendly and welcoming tone	1= course content does not imply a friendly and welcoming tone 2= few course content (25%) implies a friendly and welcoming tone 3= some course content (50%) implies a friendly and welcoming tone 4= most course content (75%) implies a friendly and welcoming tone 5= all course content (100%) implies a friendly and welcoming tone	1 2 3 4 5 NA
17. Examples and concepts in course content relate to real world situations	1= examples and concepts do not relate to real world situations 2= few examples and concepts (25%) relate to real world situations 3= some examples and concepts (50%) relate to real world situations 4= most examples and concepts (75%) relate to real world situations 5= all examples and concepts (100%) relate to real world situations	1 2 3 4 5 NA
18. The course uses multiple experiential techniques	Look for discussions, simulations, field experiences, team projects, case studies, etc. 1= the course uses very few experiential techniques 2= the course uses few experiential techniques 3= the course uses some experiential techniques 4= the course uses a considerable amount of experiential techniques 5= the course uses plenty experiential techniques	1 2 3 4 5 NA
19. The course provides a biography of the instructor and of the learners	Look for a biography that includes these elements: picture, current occupation and/or project, professional interests, contact information. 1= the course does not provide a biography of both learners and instructor 2= the course provides a biography of the learners and instructor that contains few elements 3= the course provides a biography of the learners and instructor that contains some elements 4= the course provides a biography of the learners and instructor that contains most elements 5= the course provides a biography of the learners and instructor that contains all elements	1 2 3 4 5 NA
20. The objectives of the course are clearly specified	1= the objectives are not specified 2= the objectives are specified in an unclear way 3= the objectives are specified in a moderately clear way 4= the objectives are specified in a mostly clear way 5= the objectives are specified in a clear way	1 2 3 4 5 NA

21. The course allows for the learners to choose or define their own objectives	1= learners can not choose or define their own objectives 2= learners can choose or define their own objectives in few parts of the course (25%) 3= learners can choose or define their own objectives in some parts of the course (50%) 4= learners can choose or define their own objectives in most parts of the course (75%) 5= learners can choose or define their own objectives in all parts of the course (100%)	1 2 3 4 5 NA
The utility of the course in real world situations is clearly specified or provided in examples in the introduction of the course or the course syllabus	1= the utility is not specified or provided in examples 2= the utility is specified or provided in examples in an unclear way 3= the utility is specified or provided in examples in a moderately clear way 4= the utility is specified or provided in examples in a mostly clear way 5= the utility is clearly specified or provided in examples	1 2 3 4 5 NA
22. Course content and tasks use multiple learning styles	Look for course content and tasks that require skills used by (McCarthy): 1.Imaginative learners: observing, questioning, visualizing, imagining, inferring, diverging, brainstorming, listening, speaking and interacting. 2. Analytic learners: seeing relationships and interrelationships, identifying parts, ordering, prioritizing, classifying, comparing. 3. Common sense learners: experimenting, seeing, predicting, tinkering, recording, making things work. 4. Dynamic learners: verifying, explaining, summarizing, synthesizing, re-presenting, re-focusing. 1=course content and tasks use less than two skills per style 2= course content and tasks use one of the four learning styles (at least two skills per style) 3= course content and tasks use two of the four learning styles (at least two skills per style) 4= course content and tasks use three of the four learning styles (at least two skills per style) 5= course content and tasks use all of the four learning styles (at least two skills per style)	1 2 3 4 5 NA
23. The course uses multiple teaching strategies	Look for collaborative learning/cooperative learning, discovery-based learning (the learner learns concepts by developing her own ideas while actively participating in projects), engaged learning (engaged learners are responsible for their own learning, they are self-regulated and able to define their own learning goals and evaluate their own achievement), problem-based learning (tasks with complex cognitive problems), experiential learning (discussions, simulations, field experiences, team projects, case studies), etc. 1= the course uses very few teaching strategies 2= the course uses few teaching strategies 3= the course uses some teaching strategies 4= the course uses a considerable amount of teaching strategies 5= the course uses plenty teaching strategies	1 2 3 4 5 NA
24. The course enables an environment that implies trust	Look for these elements: biography of instructor and learners, professional design, login passwords, introductory message from the instructor. 1= the course does not contain any elements 2= the course contains few elements 3= the course contains some elements 4= the course contains most elements 5= the course contains all elements	1 2 3 4 5 NA

25. The course provides opportunities for choice	Look for choice between tasks, choice of topic in tasks, choice in delivery date, choice in resources, choice of objectives, and choice in working together or individually, etc. 1= the course provides no opportunities for choice 2= the course provides few opportunity for choice 3= the course provides some opportunities for choice 4= the course provides a considerable amount of opportunities for choice 5= the course provides plenty opportunities for choice	1 2 3 4 5 NA
26. The course includes options that allow learners to work together	Look for small group discussions or chats, collaborative work on tasks, peer review of papers or products, brainstorming, etc. 1= there are no options for learners to work together 2= there are few option for learners to work together 3= there are some options for learners to work together 4= there are a considerable amount of options for learners to work together 5= there are plenty options for learners to work together	1 2 3 4 5 NA
27. The course provides opportunities for autonomous and self-directed learning	Look for tasks that are not assessed, unmonitored discussions, instructor acting as a facilitator in stead of teacher, learner freedom, tasks that encourage the learner to diagnose own learning needs, formulate own learning objectives and create own learning plan (Knowles), etc. 1= there are no opportunities for autonomous and self-directed learning 2= few parts of the course (25%) have opportunities for autonomous and self-directed learning 3= some parts of the course (50%) have opportunities for autonomous and self-directed learning 4= most parts of the course (75%) have opportunities for autonomous and self-directed learning 5= all parts of the course (100%) have opportunities for autonomous and self-directed learning	1 2 3 4 5 NA
28. Course content and the introduction is written in a way that implies respect for the learner	Look if the learner is taken seriously, is treated as an equal party, is addressed in an adult manner, etc. Examples of non-respectful ways to address the learner: hi all, welcome guys and girls, so you want to learn how to…, etc. 1= course content is not written in a respectful way 2= few course content (25%) is written in a respectful way 3= some course content (50%) is written in a respectful way 4= most course content (75%) is written in a respectful way 5= all course content (100%) is written in a respectful way	1 2 3 4 5 NA
29. The instructor has a facilitating role as opposed to a traditional role as teacher	Look for project/discussion leader options for the learner, moderator options for the learner, options for learners to evaluate the work of peers and look for a facilitating role of the instructor. 1= the instructor does not have a facilitating role in any parts of the course 2= the instructor has a facilitating role in few parts of the course (25%) 3= the instructor has a facilitating role in some parts of the course (50%) 4= the instructor has a facilitating role in most parts of the course (75%) 5= the instructor has a facilitating role in all parts of the course (100%)	1 2 3 4 5 NA

Confidence of the learner is enhanced		1=not true 2=slightly true 3=moderately true 4=mostly true 5=very true NA=not applicable
30. The instructions to the learner clearly describe the requirements to master the content of the course	Look for conditions stated in the introduction of the course or modules that will enhance the chance of mastery for the learner, for example: invest 10 hours of time and energy every week, read the required materials, look at the online course regularly, submit tasks on time. 1= the instructions do not describe the requirements to master the content 2= the instructions describe the requirements in an unclear way 3= the instructions describe the requirements in a moderately clear way 4= the instructions describe the requirements in a mostly clear way 5= the instructions describe the requirements in a clear way	1 2 3 4 5 NA
31. The course clearly specifies the skills and knowledge that will help the learner succeed at a task	1= the course does not specify any skills and knowledge 2= the course specifies skills and knowledge for few tasks (25%) 3= the course specifies skills and knowledge for some tasks (50%) 4= the course specifies skills and knowledge for most tasks (75%) 5= the course specifies skills and knowledge for all tasks (100%)	1 2 3 4 5 NA
32. Course content is well organized and structured	1= course content is not well organized and structured 2= few course content (25%) is well organized and structured 3= some course content (50%) is well organized and structured 4= most course content (75%) is well organized and structured 5= all course content (100%) is well organized and structured	1 2 3 4 5 NA
33. The course provides advance organizers	Look for these elements: charts, diagrams, concept maps, summaries, reviews, table of contents, tasks which require the learner to relate course material to her previous knowledge. 1= the course provides no advance organizers 2= the course provides few elements 3= the course provides some elements 4= the course provides a considerable amount of elements 5= the course provides plenty elements	1 2 3 4 5 NA
34. The course provides for the learner to interact with the instructional material, the instructor, and other learners	Look for: - Interaction with instructional material: reading, watching, listening, performing tasks, writing, reflecting, etc. - Interaction with the instructor: email, video, telephone, chat, threaded discussion, etc. - Interaction with other learners: email, video, telephone, chat, threaded discussion, etc. 1= the course does not provide the learner to interact with the material, instructor and peers 2= the course provides to interact with the material, instructor and peers in few ways 3= the course provides to interact with the material, instructor and peers in some ways 4= the course provides to interact with the material, instructor and peers in a considerable amount of ways 5= the course provides the learner to interact with the material, instructor and peers in plenty ways	1 2 3 4 5 NA

35. The course supports the sharing of tips and tricks by the learners	Look for tasks or course content which encourage the learner to post tips and tricks. 1= there are no tasks which encourage to post tips and tricks 2= there are few tasks which encourage to post tips and tricks 3= there are some tasks which encourage to post tips and tricks 4= there are a considerable amount of tasks which encourage to post tips and tricks 5= there are plenty tasks which encourage to post tips and tricks	1 2 3 4 5 NA
36. The course provides multiple achievement levels	Look if the course provides for extra credit possibilities such as extra challenging tasks. 1= the course does not provide multiple achievement levels 2= the course provides multiple achievement levels on few occasions 3= the course provides multiple achievement levels on some occasions 4= the course provides multiple achievement levels on a considerable amount of occasions 5= the course provides multiple achievement levels on plenty occasions	1 2 3 4 5 NA
37. The course provides personal opportunities for experiencing success	Look for scaffolding (the support the instructor provides to help the learner carry out a task) which fades (early support for learning tasks and no support for the final tasks within the whole task) in complex tasks. Examples are: - Support by the instructor: providing hints, prompts, feedback, cue cards, checklists, process worksheets, asking leading questions, giving part of a solution. - Support by task sequence: simple to complex sequencing of sub-tasks within a whole task. - Support by types of learning tasks with a lower cognitive load: worked-out example, completion task, goal-free task, reverse task. 1= the course does not provide scaffolding for complex tasks 2= the course provides scaffolding for few complex tasks (25%) 3= the course provides scaffolding for some complex tasks (50%) 4= the course provides scaffolding for most complex tasks (75%) 5= the course provides scaffolding for all complex tasks (100%)	1 2 3 4 5 NA
38. Course content is organized in increasing difficulty	1= course content is not organized in increased difficulty 2= few course content (25%) is organized in increased difficulty 3= some course content (50%) is organized in increased difficulty 4= most course content (75%) is organized in increased difficulty 5= all course content (100%) is organized in increased difficulty	1 2 3 4 5 NA
39. Tasks are organized in increasing difficulty	1= tasks are not organized in increased difficulty 2= few tasks (25%) are organized in increased difficulty 3= some tasks (50%) are organized in increased difficulty 4= most tasks (75%) are organized in increased difficulty 5= all tasks (100%) are organized in increased difficulty	1 2 3 4 5 NA
40. There is a match between performance criteria and course goals	Look for evaluative criteria for tasks and course goals. 1= there is no match between performance criteria and course goals 2= there is almost no match between performance criteria and course goals 3= there is some match between performance criteria and course goals 4= there is a considerable match between performance criteria and course goals 5= there is a match between performance criteria and course goals	1 2 3 4 5 NA

41. The course provides feedback that supports the learner's ability and effort	Look for feedback that attributes accomplishment to the learner's ability and effort in threaded discussions, message boards, etc. Feedback should contain these elements: focus on behavior, be specific, focus on few aspects, be clear, emphasize the positive. 1= the course does not provide feedback 2= the course provides poor feedback that uses few elements 3= the course provides reasonable feedback that uses some elements 4= the course provides fair feedback that uses most elements 5= the course provides good feedback that uses all elements	1 2 3 4 5 NA
42. The course provides opportunities for control	Look for control over pacing, order, time schedule and deadlines. 1= the course does not provide opportunities for control 2= the course provides few opportunities for control 3= the course provides some opportunities for control 4= the course provides a considerable amount of opportunities for control 5= the course provides plenty opportunities for control	1 2 3 4 5 NA
43. The course provides access to the main menu at all times	1= the course provides no access to main menu 2= few parts of the course (25%) provide access to main menu 3= some parts of the course (50%) provide access to main menu 4= most parts of the course (50%) provide access to main menu 5= all parts of the course (100%) provide access to main menu	1 2 3 4 5 NA
Satisfaction of the learner with the course is enhanced		1=not true 2=slightly true 3=moderately true 4=mostly true 5=very true NA=not applicable
44. Learning activities are applicable to real world situations	Look for learning activities that use real world cases or examples, stress real world utility, stress real world skills, etc. 1= learning activities are not applicable to the real world 2= few learning activities (25%) are applicable to real world situations 3= some learning activities (50%) are applicable to real world situations 4= most learning activities (75%) are applicable to real world situations 5= all learning activities (100%) are applicable to real world situations	1 2 3 4 5 NA
45. The course provides opportunities to use newly acquired knowledge or skill in a real world or simulated setting	Look for tasks that require the learner to use knowledge and skills outside the course or in simulations inside the course such as role-plays, case-studies, etc. 1= course tasks do not provide opportunities to use knowledge or skills 2= few course tasks (25%) provide opportunities to use knowledge or skills 3= some course tasks (50%) provide opportunities to use knowledge or skills 4= most course tasks (75%) provide opportunities to use knowledge or skills 5= all course tasks (100%) provide opportunities to use knowledge or skills	1 2 3 4 5 NA
46. The course provides opportunities for the learner to feel recognized by others	Look for opportunities which encourage recognition from peers: peer review, reading other learner's postings/discussion logs, peer feedback, etc. 1= there are no opportunities for recognition from peers 2= there are few opportunities for recognition from peers 3= there some opportunities for recognition from peers 4= there are a considerable amount of opportunities for recognition from peers 5= there are plenty opportunities for recognition from peers	1 2 3 4 5 NA

47. The course encourages the learner to share subject related experiences	Look for tasks, discussions, etc. in which the learner is encouraged to share experiences with the instructor and peers. 1= no tasks encourage the learner to share experiences 2 = few tasks (25%) encourage the learner to share experiences at appropriate opportunities 3= some tasks (50%) encourage the learner to share experiences at appropriate opportunities 4= most tasks (75%) encourage the learner to share experiences at appropriate opportunities 5= all tasks (100%) encourage the learner to share experiences at appropriate opportunities	1 2 3 4 5 NA
48. The course provides informational feedback	Look for feedback that corrects errors that the learner makes in message boards, threaded discussions, etc. Good feedback should contain these elements: focus on behaviour, be specific, focus on only one or two aspects, be clear, emphasize the positive. 1= the course does not provide informational feedback 2= the course provides poor informational feedback that uses few elements 3= the course provides reasonable informational feedback that uses some elements 4= the course provides fair informational feedback that uses most elements 5= the course provides good informational feedback that uses all elements	1 2 3 4 5 NA
49. The course provides motivational feedback	Look for feedback that motivates the learner to try harder in message boards, threaded discussions, etc. Good feedback should contain these elements: focus on behaviour, be specific, focus on only one or two aspects, be clear, emphasize the positive. 1= the course does not provide motivational feedback 2= the course provides poor motivational feedback that uses few elements 3= the course provides reasonable motivational feedback that uses some elements 4= the course provides fair motivational feedback that uses most elements 5= the course provides good motivational feedback that uses all elements	1 2 3 4 5 NA
50. Learner accomplishment is rewarded	Look for a clearly defined grading system, examples are: - Self-referenced grading: grades are based on comparing a learner's performance with the instructor's perceptions of the learner's ability. - Peer evaluation: grades are based on peers' evaluation of the learner's performance. - Norm-referenced grading: grades are based on students' performance in relation to each other. - Criterion-referenced grading: grades are based on objective, predetermined standards of performance. 1= there is no grading system 2= the grading system is defined in an unclear way 3= the grading system is defined in a reasonably clear way 4= the grading system is defined in a fairly clear way 5= the grading system is defined In a clear way	1 2 3 4 5 NA
51. Helpful guidance is offered at the beginning of the course	Helpful guidance should contain these elements: technical requirements, required software links, email address for questions, introduction or orientation to the course. 1= there is no helpful guidance 2= the guidance is poor and contains few elements 3= the guidance is reasonable and contains some elements 4= the guidance is fair and contains most elements 5= the guidance is good and contains all elements	1 2 3 4 5 NA

52. The course encourages the learner to reflect on her accomplishment	Look for tasks which ask the learner to reflect. A reflective task focusses on three elements: - reacting: commenting on feelings towards the learning experience, such as reacting with a personal concern about an event. - elaborating: comparing reactions with other experiences, such as referring to a general principle, a theory, or a moral or philosophical position. - contemplating: focusing on constructive personal insights or on problems or difficulties, such as focusing on education issues, training methods, future goals, attitudes, ethical matters, or moral concerns. 1= there are no reflective tasks 2= reflective tasks are poor and contain none of the elements, only the acknowledgement that the work was done 3= reflective tasks are reasonable and contain few elements 4= reflective tasks are fair and contain some elements 5= reflective tasks are good and contain all elements	1 2 3 4 5 NA
53. The course provides the learner with material and sources other than course material and sources	Examples of additional materials & sources: external websites, books, articles, journals, etc. 1= the course provides no additional material and sources 2= the course provides few additional material and sources 3= the course provides some additional material and sources 4= the course provides a considerable amount of additional material and sources 5= the course provides plenty additional material and sources	1 2 3 4 5 NA

Appendix 3: Interview introduction

Dear Madam, Sir,

Thank you for participating in the research for my master's thesis. As you probably already know, I'm conducting my graduation research for the master Educational Science and Technology from the University of Twente. My main subject is "motivation in online instruction". In this research I designed a tool to measure the motivating effect of online instruction. To validate this tool, I am interested in the experiences of users of online instruction. This way, I can find out which factors have an effect on the motivation of the student.

You have recently participated in an online course or training. What I want to ask you about during this interview has everything to do with your motivation with regard to this course or training. The goal of the interview is to find out which elements from online instruction are perceived as being motivating by students of online courses. The interview consists of 28 open questions and will take about forty-five minutes. During the interview I will write down some notes, so sometimes I will ask you to stop for a minute so I can make a note of what you are saying. A summary of these notes will appear as an appendix in my report.

I'm interested in your personal opinion and experience with the course, you are by no means being assessed. Your answers will be used anonymously and short segments can be used in my master's thesis to underwrite the results. This research is conducted independently.

If you are interested in the results, I can send you an electronic copy of my Master's thesis, which I intend to finish in March. Do you have any additional questions about the interview or the research?

Your contribution to my research is very valuable and highly appreciated!

Appendix 4: Interview questions

- Name: ……...
- Company: …….
- Course: …….
- Age: ……..
- Sex: M / F
- Country of residence: ……..……
- Highest finished education: …….

To make sure that I record everything that you tell me, it would help me a lot if I could tape this conversation. I have an mp3 player with which I can record the interview, would you mind if I use it to record our conversation?

1. Did you have fulltime access to a computer with an internet connection when you took the course? At what location(s) did you have access?
2. How familiar were you with online learning before your started the course?
3. How familiar were you with using a pc and internet applications before you started the course?
4. How many hours did you spend working on the course in total?
5. How many days or weeks were between the beginning of the course and the completion of it?
6. What was the reason or were reasons that you started with this course?
7. How familiar were your with the subject of the course before you started the course?
8. Did you have any interest in the subject of the course before you started the course?
9. Did you start the course voluntary or mandatory?
10. Did you receive any support from your superior and/or family during the course? In what way?
11. Did you enjoy the course and its activities? Why, why not?
12. What did you want to accomplish with this course?
13. Did you feel motivated during the course? Why, why not?
14. Did you finish the course? Why, why not?
15. Did the course material keep you motivated? Why, why not?
16. Did the instructor keep you motivated? Why, why not?
    16b) No instructor in course: did your superior keep you motivated? Why, why not?
17. Did the other learners keep you motivated? Why, why not?
    17b) No other learners: did your colleagues keep you motivated? Why, why not?
18. Were there specific moments during the course where you felt you were not motivated anymore? Can you describe these moments?
19. Did you think the course was interesting? Why, why not?
20. Did the course keep your attention? Why, why not?
21. Did the course relate to your personal goals? Why, why not?

22. Did you feel that the course matched your knowledge about or experience with the subject? Why, why not?
23. During the course, did you expect you could use the things you learned in the course in your life or job? Why, why not?
24. After you finished the course, did you feel you could use the things you learned in the course in your life of job? Why, why not?
25. Did you think you would succeed at the beginning of the course? Why, why not?
26. Did you feel you personally had a lot of influence on succeeding? Why, why not?
27. Did you feel satisfied with what you did and achieved during the course? Why, why not?
28. Did you feel appreciated by the instructor and other learners during the course? Why, why not?
    28b) No instructor or other learners: did you feel appreciated by your superior and colleagues during the course? Why, why not?

Are there any things we did not discuss which you want to bring up?

If I have any additional questions after this interview, could I contact you again through email/telephone?

Email: …….

Telephone: ……..

Appendix 5. ARCS-based motivation tactics list for online course material

Tactics to engage and maintain interest and curiosity of the learner
1. The homepage has an eye-catching visual or title
2. The course does not contain effects that distract the learner from course content or tasks
3. Course content contains anecdotes and examples
4. Course content is written in an active style
5. Course content and sentences are of moderate length
6. Course content poses questions or has the learner generate questions in order to learn the content
7. Course content poses problems to solve or has the learner generate problems to solve in order to learn the content
8. The course encourages the learner to post articles and resources
9. The course encourages the learner to post course related questions
10. The course provides multiple strategies of instruction
11. The course provides multiple sources for performing tasks
12. The course provides multiple assessment techniques
13. The course has a consistent screen format which includes occasional variation
14. The course provides multiple styles of content presentation
Tactics to relate course content and objectives to learner interest and needs
15. Course content is directed at the learner and uses personal pronouns
16. Course content has a friendly and welcoming tone
17. Examples in course content relate to real world situations
18. The course uses multiple experiential techniques
19. The course provides a biography of the instructor and of the learners
20. The objectives of the course are clearly specified
21. The course allows for the learners to choose or define their own objectives
22. The utility of the course in real world situations is clearly specified or provided in examples
23. Course content and tasks use multiple learning styles
24. The course uses multiple teaching strategies
25. The course enables an environment that implies trust
26. The course provides opportunities for choice
27. The course includes options that allow learners to work together
28. The course provides opportunities for autonomous and self-directed learning
29. Course content and the introduction is written in a way that implies respect for the learner

30. The instructor has a facilitating role as opposed to a traditional role as teacher.
Tactics to enhance learner confidence
31. The instructions to the learner clearly describe the requirements to master the content of the course
32. The course clearly specifies the skills and knowledge that will help the learner succeed at a task
33. Course content is well organized and structured
34. The course provides advance organizers
35. The course provides for the learner to interact with the instructional material, the instructor, and other learners
36. The course supports the sharing of tips and tricks by the learners
37. The course provides multiple achievement levels
38. The course provides personal opportunities for experiencing success
39. Course content is organized in increasing difficulty
40. Tasks are organized in increasing difficulty
41. There is a match between performance criteria and course goals
42. The course provides feedback that supports the learner's ability and effort
43. The course provides opportunities for control
44. The course provides access to the main menu at all times
Tactics to enhance satisfaction of the learner with the course
45. Learning activities are applicable to real world situations
46. The course provides opportunities to use newly acquired knowledge or skill in a real world or simulated setting
47. The course provides opportunities for the learner to feel recognized by others
48. The course encourages the learner to share subject related experiences
49. The course provides informational feedback
50. The course provides motivational feedback
51. Learner accomplishment is rewarded
52. Helpful guidance is offered at the beginning of the course
53. The course encourages the learner to reflect on her accomplishment
54. The course provides the learner with material and sources other than course material and sources